Vol. 13 MAY, 1924 No. 5

ENTRIES 3229-4062

M. J. Dorsey

BOTANICAL ABSTRACTS

PUBLISHED MONTHLY UNDER THE DIRECTION OF

THE BOARD OF CONTROL OF BOTANICAL ABSTRACTS, INC.

THE SOCIETIES NOW REPRESENTED

AND

THE MEMBERS OF THE BOARD OF CONTROL

(The Members of the Executive Committee for 1924 are indicated by asterisks)

American Association for the Advancement of Science, Section G.
*R. A. HARPER, Columbia University, New York City.
L. L. BURLINGAME, Leland Stanford University, Stanford University, California.

Botanical Society of America, General Section.
H. A. GLEASON, New York Botanical Garden, New York City.

Botanical Society of America, Physiological Section.
OTIS F. CURTIS (*Secretary of the Board*), Cornell University, Ithaca, New York.

Botanical Society of America, Systematic Section.
MARSHALL A. HOWE, New York Botanical Garden, New York City.

Botanical Society of America, Mycological Section.
C. H. KAUFFMAN, University of Michigan, Ann Arbor, Michigan.

American Society of Naturalists.
*H. H. BARTLETT (*Chairman of the Board*), University of Michigan, Ann Arbor, Michigan.
*G. R. LYMAN, West Virginia University, Morgantown, West Virginia.

American Society of Zoologists and Botanical Society of America, Joint Genetics Sections.
SEWALL WRIGHT, U. S. Bureau of Animal Industry, Washington, D. C.

Ecological Society of America.
H. L. SHANTZ, U. S. Bureau of Plant Industry, Washington, D. C.
H. C. COWLES, University of Chicago, Chicago, Illinois.

Paleontological Society of America.
ARTHUR HOLLICK, 61 Wall Street, New Brighton, New York.
G. R. WIELAND, Yale University, New Haven, Connecticut.

American Society of Agronomy.
C. B. HUTCHISON, University of California, Davis, California.
H. K. HAYES, University of Minnesota, University Farm, St. Paul, Minnesota.

American Society for Horticultural Science.
V. R. GARDNER, Michigan Agricultural College, East Lansing, Michigan.
J. W. BUSHNELL, Ohio Agricultural Experiment Station, Wooster, Ohio.

American Phytopathological Society.
*L. R. JONES, University of Wisconsin, Madison, Wisconsin.
*E. C. STAKMAN, University of Minnesota, University Farm, St. Paul, Minnesota.

Society of American Foresters.
RAPHAEL ZON, U. S. Forest Service, Washington, D. C.
E. P. MEINECKE, U. S. Forest Service Ferry Building, San Francisco, California.

American Conference of Pharmaceutical Faculties.
HEBER W. YOUNGKEN, Massachusetts College of Pharmacy, Boston, Massachusetts.
E. N. GATHERCOAL, 701 S. Wood Street, Chicago, Illinois.

Canadian Society of Technical Agriculturists.
W. P. THOMPSON, University of Saskatchewan, Saskatoon, Saskatchewan.
B. T. DICKSON, Macdonald College, Macdonald College, Quebec.

Royal Society of Canada.
F. E. LLOYD, McGill University, Montreal, Quebec.
J. H. FAULL, University of Toronto, Toronto, Ontario.

At Large

J. I. LAURITZEN, U. S. Bureau of Plant Industry, Washington, D. C.

J. R. SCHRAMM (*ex officio*), National Research Council, Washington, D. C.

Published for the Owners,

THE BOARD OF CONTROL OF BOTANICAL ABSTRACTS, INC.,

by

WILLIAMS & WILKINS COMPANY

BALTIMORE, U. S. A.

Entered as second-class matter, November 9, 1918, at the post office at Baltimore, Maryland, under the Act of March 3, 1879

Copyright, 1924, Williams & Wilkins Company

FOR EDITORIAL AND BUSINESS NOTICES, SEE THIRD COVER PAGE

CONTENTS

Agronomy 3229–3283
Bibliography, Biography and History 3284–3313
Botanical Education 3314–3318
Cytology 3319–3361
Ecology and Plant Geography 3362–3408
Forest Botany and Forestry 3409–3427
Genetics 3428–3543
Horticulture 3544–3569
Morphology, Anatomy and Histology of Vascular Plants 3570
Morphology and Taxonomy of Algae 3571–3585
Morphology and Taxonomy of Bryophytes 3586–3606
Morphology and Taxonomy of Fungi, Lichens, Bacteria and Myxomycetes 3607–3646
Paleobotany and Evolutionary History 3647–3667
Pathology 3668–3739
Pharmaceutical Botany and Pharmacognosy 3740–3801
Physiology 3802–3957
Soil Science 3958–3978
Taxonomy of Vascular Plants 3979–4048
Miscellaneous, Unclassified Publications 4049–4062

BOARD OF EDITORS FOR 1924 AND ASSISTANT EDITORS

Editor-in-Chief, J. R. SCHRAMM
National Research Council, Washington, D. C.

EDITORS FOR SECTIONS

Agronomy. C. V. PIPER, U. S. Bureau of Plant Industry, Washington, D. C.—Assistant Editor, MARY R. BURR, U. S. Bureau of Plant Industry, Washington, D. C.

Bibliography, Biography and History. CARROLL W. DODGE, Harvard University, Cambridge, Massachusetts. Assistant Editor, CHARLES A. WEATHERBY, 11 Wells Avenue, East Hartford, Connecticut.

Botanical Education. C. STUART GAGER, Brooklyn Botanic Garden, Brooklyn, New York.—Assistant Editor, ARTHUR H. GRAVES, Brooklyn Botanic Garden, Brooklyn, New York.

Cytology. GILBERT M. SMITH, University of Wisconsin, Madison, Wisconsin.

Ecology and Plant Geography. GEO. D. FULLER, The University of Chicago, Chicago, Illinois.

Forest Botany and Forestry. W. N. SPARHAWK, U. S. Forest Service, Washington, D. C.

Genetics. ORLAND E. WHITE, Brooklyn Botanic Garden, Brooklyn, New York.

Horticulture. J. H. GOURLEY, Ohio Agricultural Experiment Station, Wooster, Ohio. Assistant Editor, JOHN BUSHNELL, Wooster, Ohio.

Miscellaneous, Unclassified Publications. Editor, SAM F. TRELEASE, University of Louisville, Louisville, Kentucky.

Morphology, Anatomy and Histology of Vascular Plants E. W. SINNOTT, Connecticut Agricultural College, Storrs, Connecticut.

Morphology and Taxonomy of Algae. E. N. TRANSEAU, Ohio State University, Columbus, Ohio.—Assistant Editor, L. H. TIFFANY, Ohio State University, Columbus, Ohio.

Morphology and Taxonomy of Bryophytes. ALEXANDER W. EVANS, Yale University, New Haven, Connecticut

Morphology and Taxonomy of Fungi, Lichens, Bacteria and Myxomycetes. H. M. FITZPATRICK, Cornell University, Ithaca, New York.—Assistant Editor, DONALD S. WELCH, Cornell University, Ithaca, New York.

Paleobotany and Evolutionary History. EDWARD W. BERRY, The Johns Hopkins University, Baltimore, Maryland.

Pathology. FREDERICK V. RAND, Bureau of Plant Industry, Washington, D. C.—Assistant Editors, LILLIAN C. CASH and HARRY BRAUN, Bureau of Plant Industry, Washington, D. C.

Pharmaceutical Botany and Pharmacognosy. HEBER W YOUNGKEN, Massachusetts College of Pharmacy, Boston, Massachusetts.—Assistant Editor, E. N. GATHERCOAL, 701 South Wood St., Chicago, Illinois.

Physiology. B. M. DUGGAR, Missouri Botanical Garden, St. Louis, Missouri.—Assistant Editor, WILLIAM J. ROBBINS, University of Missouri, Columbia, Missouri.

Soil Science. A. G. MCCALL, University of Maryland, College Park, Maryland.

Taxonomy of Vascular Plants. J. M. GREENMAN, Missouri Botanical Garden, St. Louis, Missouri.—Assistant Editor, E. B. PAYSON, University of Wyoming, Laramie, Wyoming.

BOTANICAL ABSTRACTS

A monthly serial furnishing abstracts and citations of publications in the international field of botany in its broadest sense.

UNDER THE DIRECTION OF

THE BOARD OF CONTROL OF BOTANICAL ABSTRACTS, INC.

J. R. SCHRAMM, Editor-in-Chief

National Research Council, Washington, D. C.

Vol. 13 MAY, 1924 No. 5

ENTRIES 3229–4062

AGRONOMY

C. V. PIPER, *Editor*

MARY R. BURR, *Assistant Editor*

(See also in this issue Entries 3298, 3418, 3449, 3530, 3669, 3707, 3974, 4041)

3229. ANONYMOUS. **Agaul compared with Uba.** South African Sugar Jour. 7: 808b. 1923.—Agaul cane from the Winkle Spruit Experiment Station was grown in comparison with Uba in the Umhlali district, both receiving the same cultivation. The Agaul survived one of the worst droughts known in the country. A comparative analysis showed that the sucrose and purity in Agaul cane was much higher than in Uba, the fiber content much lower; 8 and 10.36 tons of Agaul and Uba, respectively, yielded 1 ton of sugar. Agaul appeared to be free from mosaic disease.—*C. Rumbold.*

3230. ANONYMOUS. **Beet sugar industry. Suggested improvements at Maffra factory.** Jour. Dept. Agric. Victoria 21: 129–137. 1923.—This report is based on investigations made of the beet sugar industry in America, in the interest of the future of the industry in Victoria, particularly as it concerns the Maffra factory. Nematodes, white fly, and a leaf hopper are said to be the chief insect pests. Wild morning glory [*Convolvulus arvensis* L.] is a serious weed in beet fields in the U. S. A. The exceptionally high sugar point is said to be the strongest advantage, and the prevalence of disease pest the most serious disadvantage, in California beet growing. Colorado is held to be the ideal sugar-beet state although the harvest season is very short and the costs therefore higher.—*Wm. E. Lawrence.*

3231. ANONYMOUS. **Jottings from my notebook.** West India Committee Circ. 38: 252. 1923.—The shea butter tree (*Butyrospermum Parkii*) is found extensively in the northern territories of the Gold Coast. Shea butter is used by the natives for cooking. An objectionable feature is the presence of about 4% of unsaponifiable matter, which, if removable, might result in commercial development as it is estimated that from existing trees 260,000 tons of shea butter could be obtained annually from the Gold Coast.—*H. N. Vinall.*

3232. ANONYMOUS. **Lotus or bird's foot trefoil.** Jour. Dept. Agric. Victoria 21: 123–124. 1923.—*Lotus major* var. *uliginosus, L. corniculatus, L. tetragonolobus, L. hispidus, L. augustissimus, L. australis,* and *L. americanus* are mentioned or briefly discussed with respect to their value and defects.—*Wm. E. Lawrence.*

3233. ANONYMOUS. **Scientific wheat-growing. Results of official tests.** Jour. Dept. Agric. Victoria 21: 117–119. 1923.—This is a report of variety tests in the Malee. The

varieties Major and Gallipoli are replacing the well established Federation. These tests show that even better yields may be expected from new unnamed hybrids. The superiority of the water soluble superphosphates is shown.—*Wm. E. Lawrence.*

3234. Birkinshaw, F. **Preliminary report on the distribution by the Inspection Division in Perak North of selected pure strains of padi.** Malayan Agric. Jour. **11**: 335–343. 1923.—Records are given of the yields of selected pure strains of rice distributed as seed for the 1922–1923 season. The experimental yield is 20–25% greater than that of local varieties; other advantages are uniformity of ripening and a higher weight per unit volume.—*R. E. Holttum.*

3235. Blakely, W. F. **Weeds of New South Wales.** Agric. Gaz. New South Wales **34**: 811–814. *1 fig.* 1923.—*Agrostemma Githago* is described, with suggestions for control and eradication; and its toxic qualities are discussed.—*L. R. Waldron.*

3236. Breithaupt. **Grassamengewinnung für unsere Grünländereien.** [**Production of grass seed for meadow cultures.**] Mitteil. Deutsch. Landw. Ges. **38**: 581–583. 1923.—This address sets forth the desirability of domestic production of grass seed and points out some of the difficulties.—*A. J. Pieters.*

3237. Bunting, B. **Annual report of the agriculturist, Government plantations, for 1922.** Malayan Agric. Jour. **11**: 291–300. 1923.—Progress of work on 5 plantations is recorded. Four are mainly planted to rubber. At the Serdang Experimental Plantation the following crops among others are now in cultivation: oil palm (*Elaeis guineensis*), kapok (*Eriodendron anfractuosum*), sisal hemp (*Agave*), Mauritius hemp (*Furcraea*), sugar cane, coffee, *Croton*, Candle nut (*Aleurites*), *Arenga sacchifera*, *Erythroxylon coca*, *Musa textilis*, Sea Island and Egyptian cottons, Roselle fiber (*Hibiscus sabdariffa*), bananas.—*R. E. Holttum.*

3238. Card, Dana G. **The marketing of Kentucky bluegrass and orchard grass seed.** Kentucky Agric. Exp. Sta. Bull. **247**: 31–61. 1923.—The average annual production of bluegrass seed in Kentucky for 1900–1921 was 425,682 bushels. The seed is stripped in late May or early June, the stripping period being about 6 days. Yields range from 5 to 25 bushels per acre with an average of about 8 bushels. The seed is cured in windrows about 18 inches deep and wide. These must be turned over frequently to prevent heating. Curing requires 2–4 weeks. Seed is usually cleaned by large dealers. Although 14 pounds per bushel is the legal weight, bluegrass usually runs 19–21 pounds per bushel. Orchard grass usually yields 10–15 bushels of seed in Kentucky as compared with 25–40 bushels in Denmark under a more intensive system of cultivation. The grass is cut with a binder and tied in small bundles and shocked for curing. Curing requires 2–4 weeks.—*W. D. Valleau.*

3239. Chevalier, Aug., A. Caville, et A. Vernet. **La culture de l'Agava cantala en Indochine.** [**The cultivation of Agave cantala in Indochina.**] Rev. Bot. Appl. et Agric. Coloniale **3**: 719–732. 1923.—Previous trials in Agave culture in Indochina have been unsatisfactory. Agaves naturalized in the dry region of Southern Annam and introduced into cultivation in 1919 are making promising growth. A plantation of 600 hectares at Dong-Mé in the Province of Phanrang will produce fiber in 1924. The plants are identified as *Agave cantala* Roxb., although they are larger and more vigorous than plants of this species cultivated in Java and the Philippine Islands.—*Lyster H. Dewey.*

3240. Christensen, Harald R. **Undersögelse over forskellige Fosfaters Oplöselighed.** [**Investigations on the solubility of various phosphates.**] Tidsskr. Planteavl **29**: 513–571. 1923.—Investigations on the composition and solubility of 61 phosphates, 32 of which are raw phosphates, are reported. Determinations were made on the absolute phosphoric acid content; the phosphoric acid in combinations soluble in a citric acid solution and in ammonium citrate; and determination of the saturation concentration of P_2O_5 in CO_2-saturate water. Investigations were also made on the content of carbonate of lime, chlorine and fluorine combinations, and the content of phosphoric acid in the carbonic acid extracts. An attempt is made to express the solubility of some of the phosphates.—*Albert A. Hansen.*

3241. Chomley, F. G. [No title.] Agric. Gaz. New South Wales **34**: 823. 1923.—At Yanco, top-dressing alfalfa with superphosphate at the rate of 200 pounds per acre gave an increase of nearly £ 14 per acre. In another trial, cultivation of alfalfa kept down weed growth and increased yields.—*L. R. Waldron.*

3242. Clayton, E. S. **Cotton experiments on the Upper North Coast.** Agric. Gaz. New South Wales **34**: 824. 1923.—Trials at 3 points gave generally unfavorable results due to

drought and insect attack. At 2 points yields of 384 and 400 pounds per acre were considered satisfactory under the circumstances.—*L. R. Waldron.*

3243. Clayton, E. S. **Fodder crops for dairy-farmers. Upper North Coast District.** Agric. Gaz. New South Wales 34: 853–858. *2 fig.* 1923.—Culture and handling of the following crops are discussed: alfalfa, velvet beans, small-grained cereals, sorghum, sugar cane, Indian cane, maize, Sudan grass, millet, and elephant grass. In N. S. W. it is difficult to maintain a successful stand of legumes as a mixture in grass pastures.—*L. R. Waldron.*

3244. Clayton, E. S., and R. N. Makin. **Farmers' experiment plots. Maize experiments, 1922–23.** Agric. Gaz. New South Wales 34: 775–780. 1923.—Coöperative experiments were conducted upon 15 private farms. Yields were reduced because of dry weather. At 1 point a maximum yield of 98 bushels per acre was secured.—*L. R. Waldron.*

3245. Davey, H. W. **Weeds and their eradication.** Jour. Dept. Agric. Victoria 21: 105–109, 186–189, 220–233, 317–319. *Fig. 53–63.* 1923.—The author discusses: *Salvia verbenaca* L.; *Oxalis cernua* Thunb.; *Ranunculus repens* L.; *Erigeron linifolius* Willd., easily controlled by pulling or cutting; *Gilia squarrosa* H. and A., native of America; *Watsonia meriana* Mill., introduced from South Africa; *Chenopodium murale* L.; *C. olidum* (*C. Vulvaria* L.); and *Acaena sanguisorba* Vahl., a native Australian grazing pest. A weak arsenical spray is recommended for large areas. That insect parasites may be imported to control this or other weeds is doubted.—*Wm. E. Lawrence.*

3246. Eaton, B. J. **Annual report of the agricultural chemist for 1922.** Malayan Agric. Jour. 11: 233–241. 1923.—Progress is reported in investigations on rubber, sources of fuel alcohol, vegetable oils, fats, fibers, etc.—*R. E. Holttum.*

3247. Geerts, J. M. **De factoren, die het product bepalen. Vijfde bijdrage: Het product van E. K. 2.** [**The factors which determine the yield. Fifth contribution. The yield of E. K. 2.**] Mededeel. Proefsta. Java Suikerindust. 1922: 113–143. 1922.—Sugarcane variety E. K. 2 has been in cultivation since 1913, at first on old soils where the cane yield was high and the sugar yield good. Then it was grown on soils planted only once before with sugarcane, where the yield in cane was higher but the yield in sugar lower. Later it was planted on new soils, which had not been in cane before and which gave still higher yields of cane but lower sugar yields. On the old rich soils this variety has been replaced by E. K. 28, so that the yields mentioned can not be fully compared with those of other varieties. It is still one of the better yielders on new soils, where the growth is heavy causing a high percentage of lodging and low sugar yields. Tabulated results are given on different plantations regarding growth, and field and weather conditions influencing yields.—*Peter J. Klaphaak.*

3248. Georgeson, C. C. **Information for prospective settlers in Alaska.** Alaska Agric. Exp. Sta. Circ. 1. *18 p., 6 pl., map.* 1923.—This revised edition of a circular issued in 1916 gives information on climate, soils, agricultural areas, crops, and other information of interest to prospective settlers.—*J. P. Anderson.*

3249. Grist, D. H. **Annual report of the agricultural instructor for 1922.** Malayan Agric. Jour. 11: 301–305. 1923.—Demonstration and experimental work of this division of the Department is recorded. Kapok (*Eriodendron anfractuosum*), roselle (*Hibiscus sabdariffa*), exhibitions and shows, school gardens, a Malay Bulletin in the Arabic character, and agricultural instruction at a new training college for teachers are discussed.—*R. E. Holttum.*

3250. Grist, D. H. **Wet padi planting in Negri Sembilan.** Dept. Agric. Federated Malay States Bull. 33. *93 p., 6 pl., map.* 1922.—The 1st part of the paper gives a general description of native rice cultivation in the state of Negri Sembilan. The 2nd deals with experiments conducted in 1915–1919. The headings are: standardization of the trial ground; catch crops; the growth of padi; spacing at transplantation; treatment of the nursery; manuring (an insoluble form of phosphate applied at transplanting, and potassium sulphate at flowering gave increased yields); variety testing; composition of Malay and Siam rice (3 tables of analyses); milling qualities of Malayan padi. Very complete descriptions of 206 varieties are given in tables 28–35. Suggestions are made for the improvement of rice cultivation in this state.—*R. E. Holttum.*

3251. Haselhoff, E. **Versuche mit neueren Phosphorsäuredüngern.** [**Trials with new phosphoric acid fertilizers.**] Mitteil. Deutsch. Landw. Ges. 39: 40–41. 1924.—Tetraphos-

phate, Kolloid Phosphate, and a form of raw phosphate were tested in comparison with superphosphate and Thomas meal, both in pot and in field trials. Barley, *Vicia faba*, oats, stock beets, and potatoes were used. In all cases the Kolloid Phosphate gave fair results, though not equal to those secured from superphosphate. Tetra and raw phosphate were, however, unsatisfactory.—*A. J. Pieters.*

3252. Hoffmann. **Die Beschaffung von Futtereiweiss durch Stickstoffdüngung der Weiden.** [**Providing protein feed by using nitrogenous fertilizers on pastures.**] Mitteil. Deutsch. Landw. Ges. 38: 547–548. 1923.—The application of sulphate of ammonia to a meadow tended to depress the legumes and to stimulate the grasses. The use of 55, 110, 220, and 440 pounds per ¼ hectare resulted in increases of 220, 385, 715, and 1485 pounds hay for ¼ hectare.—*A. J. Pieters.*

3253. Jack, H. W. **Annual report of the economic botanist for 1922.** Malayan Agric. Jour. 11: 263–266. 1923.—The most important work done during the year was in connection with the improvement of the rice crop.—*R. E. Holttum.*

3254. Jack, H. W. **Rice in Malaya.** Dept. Agric. Federated Malay States Bull. 35. *96 p., 20 pl., map.* 1923.—This is a slightly revised reprint of the series of articles published under the same title in the Malay Agric. Jour. [see Bot. Absts. 13, Entries 28, 1365] with the addition of illustrations.—*R. E. Holttum.*

3255. Konig, J. **Die Untersuchung landwirtschaftlich-wichtiger Stoffe. Fünfte, neubearbeitete Auflage. Band 1; Die Untersuchung landwirtschaftlich-wichtiger Stoffe.** [**The examination of important agricultural and agricultural commercial materials. 5th ed. Vol. 1. The examination of important agricultural materials.**] *965 p., 360 illus.* P. Parey: Berlin, 1923.—This new and enlarged fifth edition discusses in detail soil examinations—mineral soils, mechanical, minerological, physical and chemical examinations; determination of special characteristics of the soil; bacteriological examination; summary of characteristics of various mineral soils; judging the value of a soil from its characteristics evidenced through examination, soil fertility, the law of the minimum, etc. Swamp soils: taking the specimens, preparations for examining, physical and chemical examination; computation and utilization in determining the value of swamp soils; examination of top dressing materials for swamp soils by the Rimpaus system. Rocks and the products of their weathering. Lime and marl. Strontianite. Silicious soils. Lime, plaster and cement. Reports examination of animal excrements and stable manure—in fresh condition (urine and dung) and also bedding and freshening materials. Commercial fertilizer examination—water, nitrogen, phosphoric acid, calcium, magnesium, soil bacteria, etc., and special instructions for the examination of the several kinds of fertilizers. Analyses are treated in detail as follows: The ash of plants, animal matter and fuel. Feed analyses. General instructions for analyzing for water, dry matter, nitrogenous substances, fat, nitrogen-free extracts, crude fiber, ash, etc. Special instructions; chemical analyses; microscopical analyses, grains, legumes, residues from oil extraction, meals, weed seeds, pathological examinations—fungus infestations. Analyzing seeds. General remarks; special remarks—grains, grasses, legumes, forage plants, trees, vegetables, etc. Analyzing drinking water—inspecting the source; analyzing in the laboratory—physical, chemical, bacteriological, biological. Analyzing waste water. Taking specimens; physical and chemical analyses; biological analyses; pollution of water and its effect on fish, cattle, industries, soil, plants and potableness. A chapter is devoted to injury to vegetation by smoke and dust. Manner in which acids injure; internal and external evidences of injury to trees and plants; extent of injury by sulfuric acid and the resistance of the plant; inspection of localities and procuring of specimens; determination of injury from carbonic acid gas; determination of injury to the soil; analyzing combustion gas and fuel. Action of the various chemical reagents; Blochmann's reagent formulas are added in an appendix.—*W. B. Lydenburg.*

3256. Kristensen, R. K. **Ensileringsforsög.** [**Silage experiments.**] Beretning fra Statens Forsögsvirksomhed i Plantekultur 169, reported in Tidsskr. Planteavl 29: 575–632. 1923.—Silage from winter turnips kept in cellars is usually of poor quality due to sand and dirt. With proper handling, however, turnip tops can be made into a good grade of silage, although the shrinkage is large. Frozen turnips can be ensiled with profit. To make good silage, green

fodder of all kinds must not contain too much water, although if too dry there is danger of moulds; this is particularly true of alfalfa. A mixture of green rye and alfalfa made excellent silage, as did maize (corn) and field peas.—*Albert A. Hansen.*

3257. Kühn. **Berichte der Herbsttagung. Zweckmässige Anwendung des Kalkstickstoffs in der Landwirtschaft.** [Practical application of calcium cyanamide in agriculture.] Mitteil. Deutsch. Landw. Ges. 38: 592–596. 1923.—This is a popular discussion.—*F. M. Schertz.*

3258. Kyas, Otto. **Zpráva o činnosti Mor. zemského výzkumného ústavu zemědělského v Brně. 1920-21.** [Report of the Moravian agricultural research institute in Brno. 1920-21.] *200 p.* 1922.—The report contains a brief account of the organization of the station. The work of the station is divided into the following sections: bioclimatic and agrometeorological, biochemical, agrobotanical, plant-breeding, phytopathological, and horticultural. Separate reports for each section are presented, including a list of 68 papers and 60 public lectures by members of the staff.—*B. Shimek.*

3259. Lochow, F. von. **Saatstärke, Saattiefe und Reihenweite bei Winter- und Sommergetreide.** [Amount, depth and drill width of seeding winter and summer grain.] Mitteil. Deutsch. Landw. Ges. 38: 529–532. 1923.—Data are assembled to show that a relatively thin seeding of rye, wheat and oats results in better yields than thick seeding, provided proper fertilizer is used. The depth of seeding is important especially in soil infected with Fusarium; here deep seeding results in greater infection and material decrease in the number of seedlings that come through. Drill width is of little importance.—*A. J. Pieters.*

3260. Martin, R. D., W. W. Ballard, and D. M. Simpson. **Growth of fruiting parts in cotton plants.** Jour. Agric. Res. 25: 195–208. *2 pl.* 1923.—The data given concern the time interval between the appearance of successive fruiting branches, between the formation of successive internodes on the fruiting branches, and between the appearance of floral buds and their development into flowers; measurements of floral bud growth and of the growth of bolls from flower to maturity; and maturation periods of bolls. Comparisons are made of these phases of growth on several varieties under widely different environmental conditions, namely: Lone Star, Acala, Durango, and Pima Egyptian at Sacaton, Arizona, in 1921 and 1922; Lone Star near Greenville, Texas, in 1922; Meade and Sea Island near Charleston, South Carolina, in 1922. It is pointed out that this information is needed in connection with cultural methods and boll weevil-control problems.—*R. D. Martin.*

3261. Meyer, D. **Die Stickstoffdüngung der Schmetterlingsblütler.** [Fertilizing legumes with nitrogenous fertilizer.] Mitteil. Deutsch. Landw. Ges. 39: 12–14. 1924.—On red clover neither ammonium sulphate nor urea had any appreciable affect on yields. The use of both forms of nitrogen was found profitable on lucerne, the increase in yield being almost exclusively in the 1st cutting. The increased yield for *Vicia faba* was extremely slight and was profitable only for small applications of fertilizer.—*A. J. Pieters.*

3262. Mullett, H. A. **Dookie crop and fallow competition.** Jour. Dept. Agric. Victoria 21: 224–230. *2 fig.* 1923.—Soils, climate, and crops of the Dookie district are described and compared with those of the Wimmera, Australia.—*Wm. E. Lawrence.*

3263. Mullett, H. A. **Elmore crop and fallow competitions, 1922.** Jour. Dept. Agric. Victoria 21: 34–42. *Illus.* 1923.—The dry season produced a sharp contrast between good and poor farming. "Well-farmed land produced heavy crops despite the dry season, but the crops on neglected fallow, or where grown without fallow, were poor."—*Wm. E. Lawrence.*

3264. Mullett, H. A. **Shepparton crop and fallow competition.** Jour. Dept. Agric. Victoria 21: 82–94. *Illus.* 1923.—Wheat yields have increased 169% during the past 25 years in the Wimmera. The winning crop at Shepparton was made with a sowing of 75 pounds of wheat and 112 of superphosphate per acre.—*Wm. E. Lawrence.*

3265. Neubauer. **Eine einfache Methode zur Feststellung des Nähr-stoffbedürfnisses der Böden, insbesondere an Kali und Phosphorsäure.** [A simple method for the determination of the nutrient requirements of the soil, especially as to potash and phosphoric acid.] Mitteil. Deutsch. Landw. Ges. 38: 596–599. 1923.—The author presents a popular, practical discussion of field and pot experiments on potash and phosphoric acid requirements.—*F. M. Schertz.*

3266. O'Keefe, P. B. **Benalla crop and fallow competition.** Jour. Dept. Agric. Victoria **21**: 94–98. 1923.—The advantages of summer fallowing are given.—*Wm. E. Lawrence.*

3267. Ramsay, J. T. **Potato experiments, Werribee.** Jour. Dept. Agric. Victoria **21**: 110–114. *4 fig.* 1923.—This is a report of tests pertaining to the value of manures, immature seed, source of seed, selection, varieties, and the effects of irrigation.—*Wm. E. Lawrence.*

3268. Raum, H. **Untersuchungen über Mischsaaten von Getreide.** [**Investigations on mixed seeding of cereals.**] Mitteil. Deutsch. Landw. Ges. **38**: 587–590. 1923.—A late maturing winter rye and an early maturing wheat were planted on 5 adjacent fertilized plats, alone and in mixtures of the following wheat-to-rye proportions: $\frac{3}{4}$: $\frac{1}{4}$; $\frac{1}{2}$: $\frac{1}{2}$; $\frac{1}{4}$: $\frac{3}{4}$. Highest yields of grain were obtained with rye alone, lowest with wheat alone, while the mixture of $\frac{3}{4}$ rye and $\frac{1}{4}$ wheat yielded about the same as rye alone. All mixtures showed higher yields of straw than wheat or rye alone, the mixture $\frac{3}{4}$ rye and $\frac{1}{4}$ wheat yielding 10% more than pure rye. The spring crops, oats, barley and wheat, were sown alone and in different mixtures in similar experiments. Grain yields from oats alone, barley alone, and oats and barley mixed were higher than from any of the other mixtures, while straw yields were about the same in all seedings. All grain mixtures gave higher yields than wheat alone. Oats and barley mixed exceeded the other grain mixtures and barley alone. Straw yields from mixtures were no larger than from oats, barley, or wheat alone.—*W. J. Sando.*

3269. Сапегин, А. [Sapegin, A.] **Вариапонная статистика. Элементарный учебник для агрономов.** [**Variational statistics. An elementary text-book for agronomists.**] *79 p.* Харьков, Народный комиссариат эемдедия Украины, 1922. [The Ukrainian People's Commissariat of Agriculture.] Kharkov, 1922.—The author attempts to solve the agronomist's problems by statistics of variable quantities, or "variational statistics," as the work is entitled. Mathematics enters very largely into the discussions. A large number of formulae are given which are applicable to agronomic research.—*A. J. Bruman.*

3270. Saunders, C. B. **Official seed testing station for England and Wales. Fifth annual report.** Jour. Nation. Inst. Agric. Bot. **1922**: 24–35. 1922.—The methods used in testing seeds at the Seed Testing Station of the Institute of Agricultural Botany are described in such detail as to give the reader a definite understanding of how the work is done. It is evident that in adopting methods the best has been taken from the practice of the principal seed-testing stations of all countries. The treatment of broken seeds in the purity examination seems the most noticeable variation from general practice.—*E. Brown.*

3271. Schurig. **Sind die üblichen Kulturmassnahmen und Pflegearbeiten der Saaten richtig?** [**Are present methods of soil preparation and culture correct?**] Mitteil. Deutsch. Landw. Ges. **38**: 532–534. 1923.—This is a popular discussion of plowing, depth of seeding, and depth of cultivating sugar beets.—*A. J. Pieters.*

3272. South, F. W. **Annual report of the chief agricultural inspector for 1922.** Malayan Agric. Jour. **11**: 242–262. 1923.—This report deals with the incidence of diseases and pests of rubber, coconuts, padi and other crops; notes on general agriculture (including fruits), and agricultural legislation.—*R. E. Holttum.*

3273. Southee, E. A. **Seed maize content. Hawkesbury district, 1922-23.** Agric. Gaz. New South Wales **34**: 789–790. 1923.—Thirteen contested for prizes in securing seed from Large Red Hogan. A maximum yield of 66 bushels was secured.—*L. R. Waldron.*

3274. Spring, F. G. **Annual report of the agriculturist for 1922.** Malayan Agric. Jour. **11**: 285–290. 1923—Report is made among others on cover crops, fibers, tobacco, tuba root (*Derris elliptica*), and fruit.—*R. E. Holttum.*

3275. Stewart, George. **Sevier wheat.** Jour. Amer. Soc. Agron. **15**: 385–392. 1923.—This new variety of wheat originated in Sevier County, Utah.—*F. M. Schertz.*

3276. Tregenna, C. J. **Tobacco growing in New South Wales.** Agric. Gaz. New South Wales **34**: 669–671. *1 fig.* 1923.—The 1st official record seen by the writer of the growing of tobacco in New South Wales was for the year 1861. The most promising region for the production of leaf which more closely resembles that imported from America lies in the area Tumut to Wagga and south thereof. The American leaf is most popular throughout the world, and its aroma has become standard.—*Mary R. Burr.*

3277. Watson, W. W. **Can the wheat yield of the Central-West be doubled?** Agric. Gaz. New South Wales **34**: 317–321. 1923.—It is suggested that the wheat yields can be doubled by: (1) sowing suitable varieties of pure graded seed; (2) manuring judiciously; (3) continually cultivating the land when not being cropped; (4) rotating crops; (5) raising sufficient sheep to keep down weeds from fallow land and to eat back rank growth of wheat and oats.—*W. J. Sando.*

3278. Weber, C. A. **Die Unkrautbekämpfung auf dem Grünlande. [Fighting weeds in grassland.]** Mitteil. Deutsch. Landw. Ges. **39**: 18–22. 1924.—Popular.—*A. J. Pieters.*

3279. Wenholz, H. **Boys' maize-growing competitions.** Agric. Gaz. New South Wales **34**: 791–792. 1923.—A scale of points and rules is suggested.—*L. R. Waldron.*

3280. Wenholz, H. **Maize for cornflour.** Agric. Gaz. New South Wales **34**: 788. 1923.—Thirteen farmers contested in growing strains of Hickory King. A maximum yield of nearly 60 bushels was secured.—*L. R. Waldron.*

3281. Wenholz, H., and E. S. Clayton. **Cultivation of cotton in New South Wales.** New South Wales Dept. Agric. Farmers Bull. 150. *29 p., 8 fig., 1 map.* 1923.—The subject is treated from the standpoint of history, guaranteed prices, production in other countries, types, varieties, conditions favorable to the crop, methods of cultivation, harvesting, grading, ginning, insect pests, diseases, yields, and prospects.—*L. R. Waldron.*

3282. Whittet, J. N. **Depasturing experiment. Glen Innes Experiment Farm.** Agric. Gaz. New South Wales **34**: 793–798. *1 fig.* 1923.—Plot 1 was planted to a mixture of 8 pounds of *Phalaris bulbosa* and 4 of *Trifolium repens;* plot 2 to a mixture of 12 pounds *Dactylis glomerata,* 15 of *Lolium perenne,* and 6 of *Trifolium pratense perenne.* The plots were pastured by sheep and results are given.—*L. R. Waldron.*

3283. Wilson, Archie Dell, and C. W. Warburton. **Field crops.** *515 p., 166 fig.* Webb Publishing Co.: St. Paul, Minnesota, 1923.—This new and revised edition of this work, which was first published in 1912, deals in a general way with field crops. The book is designed primarily for the use of students of high school grades, for agricultural schools and colleges, and is written in a non-technical manner. It is divided as follows: (1) classification of crops and growth of plants; (2) grain crops; (3) forage crops; (4) miscellaneous crops, as root and tuber crops, sugar plants, fiber plants, and tobacco; (5) rotation of crops, and weeds. The chapters conclude with short reference lists.—*Mary Burr.*

BIBLIOGRAPHY, BIOGRAPHY, AND HISTORY

C. W. Dodge, *Editor*

Charles A. Weatherby, *Assistant Editor*

(See also in this issue Entries 3258, 3315, 3739, 3757, 3855, 3984, 3988, 4012)

3284. Anonymous. [O., W.] **Die neue Biologische Station des Bergen-Museums. [The new biological station of the Bergen Museum.]** Internat. Rev. Ges. Hydrobiol. u. Hydrograph. **11**: 221. 1923.—An account of a new biological station in Sweden is presented.—*N. Carter.*

3285. Anonymous. **George Frederick Hose (1838-1922).** Jour. Botany **60**: 272–273. 1922.—A short sketch is given of the botanical work of George Frederick Hose, Bishop of Singapore from 1881 to 1889.—*Adele Lewis Grant.*

3286. Anonymous. **Government publications and their distribution.** Nature **112**: 925–926. 1923.—The writer reviews the purpose of government publications and compares the methods of distribution in Britain and the U. S. A. The less liberal policy of distribution in Britain is to be further curtailed. This is deplored and the suggestion offered that the research activity in the U. S. A. may be due in part to the generous distribution of publications.—*O. A. Stevens.*

3287. Anonymous. **Professor Arno Viehoever.** Amer. Jour. Pharm. **95**: 758–763. *Photo.* 1923.—This is a biographical sketch of Arno Viehoever, recently elected to the Chair of Biol-

ogy and Pharmacognosy at the Philadelphia College of Pharmacy and Science. For 10 years he has been associated with the U. S. Bureau of Chemistry as head of the pharmacognosy laboratory. A partial list of his publications is appended.—*Anton Hogstad, Jr.*

3288. ANONYMOUS. **Prof. Dr. Edward Janczewski urodzony w Blinstrubiszkach na Zmujdzi 14 grudnia 1846 r. † w Krakowie 17 lipca 1918 r. [Dr. Edward Janczewski, born in Blinstrubiszki in Samojibia Dec. 14, 1846, died in Krakow July 17, 1918.]** Ogrodnictwo vol.? *pp.?*. 1923.

3289. ANONYMOUS. **Tropical Agriculture. The official journal of the Imperial College of Tropical Agriculture [St. Augustine, Trinidad, West Indies].** Tropical Agric. 1[1]: 1. 1924.—The 1st number of this new monthly journal was issued in January, 1924. The editor will be glad to consider authoritative articles for publication; and invites correspondence on all matters pertaining to tropical agriculture, science and development, which will be answered but not necessarily published.—*J. R. Schramm.*

3290. BIGOURDAN, G. **Projet d'une nouvelle bibliographie des sociétés savantes de la France. [A project for a new bibliography of the learned societies of France.]** Compt. Rend. Acad. Sci. Paris 177: 374–376. 1923.

3291. BRITTEN, JAMES. **Bibliographical notes. LXXXV, Robert Brown and 'The Monthly Magazine.'** Jour. Botany 60: 177–184. 1922.—The author gives his reasons for believing that Samuel Frederick Gray was the author of the unsigned botanical notes and reviews which appeared in the little known The Monthly Magazine and British Register from 1807 until 1815. The articles are important because it is believed that among them are the ones which contained the criticisms of the Latin used by Robert Brown. This criticism, many thought, led Mr. Brown to discontinue the publication of his book. The reviews which concern Mr. Brown and the Prodromus are reprinted.—*Adele Lewis Grant.*

3292. BRITTEN, JAMES. **Edward Adrian Woodruffe-Peacock (1858-1922).** Jour. Botany 60: 161–162. 1922.—This is an abbreviated account of the life and botanical work of Mr. Woodruffe-Peacock, Vicar of Grayingham, who published a number of papers on systematic botany and ecology.—*Adele Lewis Grant.*

3293. BRITTEN, JAMES. **Ethel Sarel Gepp.** Jour. Botany 60: 193–195. 1922.—The author gives a biographical account of this English algologist, who died Apr. 6, 1922.—*Adele Lewis Grant.*

3294. BRITTEN, JAMES. **Frederick Arnold Lees.** Jour. Botany 60: 97–100. *Portrait* 1922.—The author gives a short biography of Dr. Lees, an English physician who collected a large herbarium of mosses and flowering plants.—*Adele Lewis Grant.*

3295. BRITTEN, JAMES. **George Simonds Bougler (1853-1922).** Jour. Botany 60: 232–236. 1922.—An extended account is given of the botanical work and publications of Prof Bougler.—*Adele Lewis Grant.*

3296. BRITTEN, JAMES. **Henrietta Cerf (1810-1877).** Jour. Botany 60: 297–298. 1922.—This is a short account of some of the botanical work of Henrietta Cerf of Belgium, who contributed some notes to vols. 3, 4, and 5 of Hooker's Journal; these notes were signed "H. C."—*Adele Lewis Grant.*

3297. BRITTEN, JAMES. **In memory of William Carruthers (1830-1922).** Jour. Botany 60: 249–256. 1922.—The author gives a review of the life and work of this paleobotanist.—*Adele Lewis Grant.*

3298. BURKILL, I. H. **The historical aspect of certain local industries.** Singapore Nat. 2. *34–44.* 1923.—This paper deals with the history of the development of agricultural industries in the Malay Peninsula.—*R. E. Holttum.*

3299. CAPPARONI, PIETRO. **Magistri Salernitani nondum cogniti, a contribution to the history of the medical school of Salerno.** Wellcome Hist. Med. Mus. Res. Studies in Med. Hist. 2: *vii + 68 p., 28 pl.* 1923.

3300. CERIGHELLI, R. **Riccardo Luzzato, 1876-1922.** Bull. Soc. Chim. Biol. 5: 690–692. 1923.—Luzzato was professor of experimental pharmacology in the University of Modena.—*Joseph S. Caldwell.*

3301. CHOULANT, LUDWIG. **Graphische Incunabeln für Naturgeschichte und Medicin. [Illustrated incunabula of natural history and medicine.]** *x + 168 p.* Münchener Druck:

Munich, 1924.—This is a reprint of this work originally issued in 1858 and contains extensive bibliographical notes on the issues, editions, and illustrations of Bartholomaeus Anglicus, the Herbarius Moguntinus, the Ortus Sanitatis, the Arbolaire, Hieronymus Brunschwig, Macer Floridus, Petrus de Crescentiis, and Conrad von Megenberg.—*C. W. Dodge.*

3302. Fisher, G. Clyde. **A common name for Phacelia Purshii.** Torreya 23: 106. 1923. —In the valley of the Great Miami River in western Ohio, *Phacelia Purshii* Buckl. is known as Miami Mist, and this name is used in Wood's Class-Book of Botany, ed. 1853, p. 437.—*J. C. Nelson.*

3303. Gamble, J. S. **John Firminger Duthie.** Jour. Botany 60: 151–153. 1922 [see Bot. Absts. 13, Entry 2249].

3304. Henderson, Lawrence T. **The life and services of Louis Pasteur.** Proc. Amer. Phil. Soc. 62: iii–xiii. 1923.

3305. J[ackson], B. D. [**T. F. Cheeseman.**] Nature 112: 871. 1923.—Cheeseman, curator of the Auckland Museum, died in October, 1923; he was born at Hull in 1846. His Manual of the New Zealand Flora published in 1906 is regarded as one of the best local floras in existence. At the time of his death he had read part of the proof of the revision.—*O. A. Stevens.*

3306. Kremers, Edward. **Hermann Thoms.** Jour. Amer. Pharm. Assoc. 12: 569–570. *Frontispiece.* 1923.

3307. Marzell, Heinrich. **Die Volksnamen der Mistel.** [The folk-lore of mistletoe.] In: Tubeuf, Karl von. **Monographie der Mistel.** [A monograph on mistletoe.] *P. 85–87.* R. Oldenbourg: Munich and Berlin, 1923 [see Bot. Absts. 12, Entry 6694].

3308. Newberry, P. E. **Egypt as a field for anthropological research.** Nature 112: 940-944. 1923.—This is from the presidential address to Section H (Anthropology) at the British Association at Liverpool, Sept. 17. It contains comments on the use of wood in Egypt. Egypt has no coniferous trees and no timber at all suitable for building. The writer believes that the *sd*-wood mentioned in the Pyramid Texts is *Cupressus sempervirens* var. *horizontalis.* The wood of *Cedrus libani* is light and spongy, apt to shrink and warp badly, and is in no sense valuable. The tree called *tr.t* may have been the cypress, but what one produced the *ntr* poles is a problem. The resins and oils used for embalming must have been imported.—*O. A. Stevens.*

3309. Parish, S. B. [Speech, annual dinner of California Botanical Society for 1914.] Madroño 1: 71–75. *Portrait.* 1922.—Reminiscences of early California botanists and collectors, the names of Parry, Greene, Harkness, Behr, Kellogg, Gray, Englemann and Pringle being mentioned.—*Roxana Stinchfield Ferris.*

3310. Pearson, William Henry. **George Alfred Holt.** Jour. Botany 60: 207–208. 1922. —The author gives a short résumé of the botanical achievements of this English cryptogamic botanist, who died in Dec., 1921.—*Adele Lewis Grant.*

3311. Schaefer, Hugo H. **John George Gadamer.** Jour. Amer. Pharm. Assoc. 12: 833–834. *Frontispiece.* 1923.—Professor Gadamer is well known for his extensive researches on alkaloids and glucosides as well as many other phases of pharmaco-chemical research.—*Anton Hogstad, Jr.*

3312. Schaefer, Hugo H. **Leopold van Itallie.** Jour. Amer. Pharm. Assoc. 12: 755. *Frontispiece.* 1923.

3313. Thayer, W. S. **The contributions of Pasteur to medicine and humanity.** Science 58: 475–483. 1923.

BOTANICAL EDUCATION

C. Stuart Gager, *Editor*

Arthur H. Graves, *Assistant Editor*

(See also in this issue Entry 3249)

3314. Grier, N. M. **Premedical education in biological sciences from viewpoint of deans of Class A medical schools.** [Abstract.] Anat. Rec. 26: 351–352. 1923.

3315. Наумов, Н. А. [Naumov, N. A.] **Курс фитопатологии.** [Textbook on phytopathology.] *392 p., 53 fig.* Published by the Government: Moscow and Petrograd, 1923.—The textbook is a series of lectures read by the author at the Stebut's Agricultural College for Women, in 1917; the 1st part was published in 1917 and the remaining in 1921 and 1922. The lectures are as follows: (1) introduction; (2) fungi, general review; (3) main flowering parasites and semi-parasites; (4) main bacterial diseases of cultivated plants; (5) diseases caused by Myxomycetes; (6) diseases caused by lower fungi; (7) methods of cultivation of saprophytic fungi; (8) diseases caused by higher Peronosporales; (9) lower Ascomycetes; (10) parasites from family Erysiphaceae; (11) theory of spraying; (12) diseases caused by Pyrenomycetes; (13) diseases caused by Discomycetes; (14) smut fungi, their biology, morphology and systematics, and diseases caused by them, with the control measures; (15) theory of seed disinfection, and sterilization by heat; (16) pathological studies of the grains and flour; (17) principle diseases caused by rust fungi; (18) methods of cultivation of parasitic fungi and methods of artificial inoculations; (19) higher basidiomycetes and diseases caused by them; (20) diseases of trees and of wood; (21) imperfect and sterile fungi and diseases caused by them; (22) non-parasitic diseases of cultivated plants; (23) most common physiological diseases; (24) organization of plant-disease control.—After the last lecture the author gives a brief review of the most important recent developments in phytopathology since 1917 and also an extensive list of the Russian and other literature, grouped under each lecture, with a list of additional literature on miscellaneous subjects.—*C. D. Sherbakoff.*

3316. Paulsen, Ove. **Le vigtigste Plantegrupper.** [The more important plant groups.] *8 vo, xiv + 169 p.* Gyldendalske Boghandel: Copenhagen, London, Berlin, 1923.—This is a short text-book in systematic botany laying stress upon such orders or genera as are either of economic importance or of special scientific interest.—*Ove Paulsen.*

3317. Tansley, A. G. **The use of the term "respiration" in biology.** School Sci. Rev. 5: 71–73. 1923.

3318. Youngken, H. W. **Animal-eating plants.** Amer. Jour. Pharm. 95: 329–350. *Fig. 1–11.* 1923.—Descriptions are presented out of a group of some 500 plants, including the sundews, fly-traps, pitcher-plants, bladderworts and butterworts. A bibliography is given. —*Anton Hogstad, Jr.*

CYTOLOGY

Gilbert M. Smith, *Editor*

(See also in this issue Entries 3344, 3458, 3474, 3518, 3535, 3570, 3571, 3577, 3579, 3580, 3581, 3585, 3701, 3702, 3824, 3851)

3319. Agersborg, H. P. Kjerschow. **The sex of the nudibranchiate mollusca. I. With special reference to germ-cell secretions in Melibe leonina** (Gould). [Abstract.] Anat. Rec. 26: 346. 1923.

3320. Anitschkow, N. **Über Quellungs- und Schrumpfungserscheinungen an Chondriosomen.** [Swelling and shrinkage effects of chrondriosomes.] Arch. Mikrosk. Anat. 97: 1–13. 1923.—The changes in chondriosome form in liver cells of Axolotyl, frogs, and rabbits were studied after these had been treated, before fixation, with hypo-, hyper-, and tonic NaCl solutions. Fixation was with 10% formalin prepared from Koch's ½% salt solution, Müller formalin, and the fluid of Champy. Staining was by Kull's or by Heidenhain's modified Altman method. Imbedding was in celloidin and mounting after the method of Rubaschkin. By changing the concentrations of the NaCl solutions, all forms of chondriosomes described could be found in the same or similar cells. The form of the chondriosome is directly related to the osmotic properties of the surrounding suspension fluid. Plasma vacuolization may be caused by the chondriosomes changing from rod to spherical forms, with the subsequent swelling of the latter. The granular structure of the cell plasma may appear foam like, due to a fusion and anastomosing of such vacuoles. There is no fundamental difference between a vacuolate and a foamy plasma structure since each may correspond to a certain osmotic pressure of the suspension fluid. By the transformation and swelling of the chondriosomes, their substance becomes redisposed peripherally around a vacuole, thus simulating an envelope within which

there may be condensed various small clumps or granules. Both envelope and clumps seem to be lipoid in nature. Each plasmal body, chondriosome or otherwise, exhibits similar osmotic properties if the suspension fluid be water, and all may redispose their substance so as to include a vacuole. Some of the phenomena seen with plasmolyzed plant cells or the irregular forms of bacteria might be traced to similar conditions. Hypertonic salt solutions lead to the elongation and shrinkage of the chondriosomes.—*H. C. Sands.*

3321. Bowen, Robert H. **The acrosome of the animal sperm.** [Abstract.] Anat. Rec. **26:** 347. 1923.

3322. Bremer, G. **A cytological investigation of some species and species hybrids within the genus Saccharum.** Genetica **5:** 97–148. *52 fig.* 1923.—The haploid chromosome number of *Saccharum spontaneum* was found to be 56. The reduction division is normal. In sugar cane, *Saccharum officinarum*, 40 haploid chromosomes were found. Regular and irregular meiotic divisions may occur in certain varieties; in certain other varieties all divisions are regular. In the irregular divisions there are several single chromosomes which lag behind but eventually divide and pass to the poles.—*Karl Sax.*

3323. Budington, R. A. **Consequences of accelerating certain phases of the mitotic apparatus during first cleavage.** [Abstract.] Anat. Rec. **26:** 348. 1923.

3324. Chifflot, J., et Cl. Gautier. **Sur le mouvement brownien intraprotoplasmique des granulations protoplasmiques.** [Brownian movement within the protoplasm of protoplasmic granules.] Compt. Rend. Soc. Biol. **89:** 236–238. 1923.—In various plant cells, (*Closterium*, *Cosmarium*, *Spirogyra* and hairs of *Azolla caroliniana*) both when young and when adult, Brownian movement of protoplasmic granules is observed. An induced current gradually slows up the movement without causing any orientation toward either pole. Various lights of different intensities have no effect on the movement. Plasmolysing and fixing reagents, which change the water content and thus the viscosity of the protoplasm, alter the movement accordingly; they stop the movement of the protoplasmic microsomes before that of the crystalline inclusions. The Brownian movement thus varies with the physical state of the protoplasm.—*Oran Raber.*

3325. Dangeard, Pierre. **Coloration vitale de l'appareil vacuolaire chez les Péridiniens marins.** [The intravital staining of the vacuolar system of marine Peridineae.] Compt. Rend. Acad. Sci. Paris **177:** 978–980. *1 fig.* 1923.—When the organisms were stained with neutral red, the cell sap took on a reddish orange color, thus indicating that it was slightly alkaline. The vacuolar system is found to be of the dissociate type, which is quite rare in the higher plants, being found only in special tissues, as the meristem, pollen grains, or seedlings. The figure is of *Ceratium tripos*.—*C. H. Farr.*

3326. Dangeard, Pierre. **Remarques sur l'état de l'huile a l'intérieur des graines oléagineuses.** [Remarks on the condition of the oil in the interior of fatty seeds.] Compt. Rend. Acad. Sci. Paris **177:** 67–69. *Fig. A–B.* 1923.—Policard and Mangenot claim to have found that in fatty seeds the cytoplasm is an emulsion in the oil [see Bot. Absts. 13, Entry 3346]. A study is made of the aleurone of *Ricinus* and of the seeds of conifers, by intravital staining of living cells. The cytoplasm is found to be alveolar, and in the alveoli are the nucleus and the aleurone grains. There are also the very large number of distinct oil globules, which constitute the reserve oil of the seeds. The oil is, then, not a continuous phase, but is in the form of spherules which are inclusions in the cytoplasm. This work thus supports the usual concept that oil is in the form of an emulsion in the cytoplasm.—*C. H. Farr.*

3327. Docquier, Ed. **La division nucléaire chez l'Anthophysa vegetans (O. F. M.) Stein.** [Nuclear division of Anthophysa vegetans.] Compt. Rend. Soc. Biol. **89:** 443–445. *5 fig.* 1923.—The cytological changes are described for this member of the Monadineae.—*Oran Raber.*

3328 Grüss, J. **Lithogene und normale Verkalkung.** [Stone-forming and normal calcification.] Ber. Deutsch. Bot. Ges. **37:** 531–543. *Pl. 9, 25 fig.* 1920.—In the lime deposition in certain marine algae (*Corallina*, *Lithothamnium*, *Galaxaura*, and *Halimeda* spp.) in which calcification is normal, microscopic lime-crystals, with long-axes radially directed, are laid down in the cell walls. These are separated by pores and canals, leaving a readily permeable spongy structure. In bringing about a secondary, more completely calcified, stone-like con-

dition, bacteria and fungi disintegrate the cell contents and organic parts of the walls, which are more or less replaced by minute irregularly disposed lime crystals, with some carbonized remnants. Thin layers of coal in a limestone deposit below Partenkirchen on the Loisach are believed to represent algal remains.—*Marshall A. Howe.*

3329. Guilliermond, A. **Sur la coloration vitale des chondriosomes. [The vital staining of chondriosomes.]** Compt. Rend. Soc. Biol. **89**: 527–529. 1923.—Vital staining of chondriosomes is possible in the vegetable as in the animal cell by means of dahlia violet and Janus green. The staining is effected on the living material but it is quickly followed by changes in the chondriosomes which end in cell death. Vital staining of fungi, such as species of *Saprolegnia*, is easier than of the higher plants, the walls of which are less permeable, although the leaf of *Iris germanica* furnishes excellent material. The plastids color more slowly and less easily than the chondriosomes.—*Oran Raber.*

3330. Guilliermond, A., et G. Mangenot. **Observations cytologiques sur le mode de formation des essences. [Cytological observations on the mode of formation of essences.]** Compt. Rend. Acad. Sci. Paris **177**: 600–603. *Fig. 1–8.* 1923.—Tschirch holds that the volatile oils are formed by a transformation of the cellulose walls; Politis that they come from the tannins; while Moreau associated their formation with changes in the chondriosomes, and regards them as simple lipoids. Trichomes of walnut, and secretory organs of the Umbelliferae, Compositae, and Rutaceae were sectioned on the freezing microtome and mounted in Apathy's medium or in glycerine jelly. The mitochondrial origin of the volatile oils is confirmed, and carefully described.—*C. H. Farr.*

3331. Guilliermond, A., et G. Mangenot. **Sur l' "autoplastensekret" et le "mesekret" d'Arthur Meyer. [The "autoplastensekret" and the "mesekret" of Arthur Meyer.]** Compt. Rend. Soc. Biol. **89**: 240–242. 1923.—Meyer says that the oily globules of Guilliermond found in chloroplasts and also free in the cells of the mesophyll are neither oily nor lipoid substances but are a mixture of aldehydes and acids formed as waste products from photosynthesis. The "mesekret" globules are also formed in the plastids but become freed from them. Guilliermond combats this idea and offers as proof of his position that in *Iris germanica* the "globules" after once being formed are reabsorbed, showing that they are not waste products. He shows that corresponding "grains" are found in cells lacking chloroplasts and in cells where the plastids are never observed to form such grains. Furthermore, these "corpuscles" do not give the reactions of aldehydes and do give those of oleaginous materials.—*Oran Raber.*

3332. Hance, Robert T. **Chick chromosomes and sex determination.** [Abstract.] Anat. Rec. **26**: 348–349. 1923.

3333. Kihara, H., and T. Ono. **Cytological studies on Rumex. 1. Chromosomes of Rumex acetosa L.** Bot. Mag. Tokyo **37**: (84)–(90). 1923. (English résumé, *p. 35–36.*)—Chromosomes were counted in the root-tips of 29 plants of *Rumex acetosa*. 25 of these had 14 chromosomes, 2 being large; the remaining 4 showed 15 chromosomes, 1 of which was large. The pollen-mother-cells were examined in 1 of the 15-chromosome plants. The large odd chromosome combined with 2 smaller ones to form a trivalent, in the shape of a *V*. At the 1st anaphase, the 2 small chromosomes went to 1 pole, and the large one to the other. There were thus equal numbers of pollen grains with 7 and with 8 chromosomes. (Counts of the chromosomes of this species by another investigator gave 16.)—*John Belling.*

3334. Kisser, Josef. **Amitose, Fragmentation und Vacuolisierung pflanzlicher Zellkerne. [Amitosis, fragmentation and vacuolization in plant nuclei.]** Sitzungsber. Akad. Wiss. Wien (Math.-Nat. Kl.) Abt. 1. **131**: 105–128. *2 pl.* 1922 [1923].—Amitosis is characterized as follows: amitotic division occurs only in cells which have previously undergone mitotic division; the quantity of chromatin does not increase, since an equational partition of the hereditary substance is not necessary; nuclear division is not followed by cell division but polyenergid cells are the result. Amitotic division is a simplified form of mitotic division and is derived from the latter. Schurhoff's opinion that the number of daughter nuclei following amitosis can not exceed the number of chromosomes, i.e., there is no partition of chromosomes, is not substantiated. In internodal cells of *Chara* there may be as many as 6000–8000 nuclei derived by amitotic division. Relatively few examples of true amitosis are known in plants; these occur notably in *Chara*, *Nitella*, the binucleate canal cells of the style in *Lilium Marta-*

gon, and others.—Under fragmentation are grouped a number of changes observed in nuclei which lead to its disintegration but are not truly processes of direct division. Examples of fragmentation were found in old stems of *Tradescantia*, the leaves of *Funkia*, pith of *Tropaeolum*, etc. This is considered to be a manifestation of senility. Extensive vacuolization, sometimes resulting in partition of the nucleus, is described in the nuclei of declining tissues of a number of plants, this being also a feature of senility. The vacuoles were found to contain an osmotically active fluid.—*F. Weiss.*

3335. London, E. S. **Atom und Zelle.** [**The atom and the cell.**] Arch. Mikrosk. Anat. **97**: 48–53. 1923.—A highly speculative comparison between the ultimate constitution of the organic and inorganic words is presented. The atom is the fundamental unit of every substance; the cell, the fundamental unit of life. Similarity of position in the two systems permits the assumption of structural similarity. The kind of atom is determined by the number of positive charges carried by its nucleus; the kind of cell, by the number of positively charged chromatin particles, the chromosomes of its nucleus. The individuality of the atom is determined through the constancy of the complexes of positively charged nuclear particles since the loss of α-particles from the nucleus changes the nature of the atom. Similarly, the nature of the cell is determined through the constancy of positively charged nuclear particles, the chromosomes. The loss of positively charged chromosomes from the cell alters its nature and produces mutation. Position changes of the particles in the atom cause no essential atomic change; they may lead only to the beginning of some physical or chemical process. Position changes of the cell contents are without influence upon the structure of the cell. Microscopically, such position changes are clearly visible in the cells of *Tradescantia virginica* and other plants and involve only some chemical or physical changes on which the life of the cell depends. The sum of the phenomena creates the picture of a circle without the literal concept of either revolution about a point or, necessarily, a specific path. As yet the atom structure is too abstract to determine in what form the energy exists that forces the ions to their constant orbits. It is assumed that no energy is consumed in this motion. No self sufficient vital energy is presupposed to interfere with the law of energy conservation.—The analogy leads to the conclusion that in the universe, in the units of its worlds, in the cell during the course of its life, and in the atom, one and the same dynamic principle holds,—the revolution in definite orbits of peripheral elements about a nucleus.—*H. C. Sands.*

3336. Maige, A. **Etats d'équilibre du noyau pendant la digestion de l'amidon dans les cellules de la pomme de terre.** [**Equilibrium states of the nucleus of potato cells during the digestion of the starch.**] Compt. Rend. Soc. Biol. **89**: 556–558. 1923.—When potato cells are placed in contact with water the size of the nucleus and nucleolus decreases until a new equilibrium is reached. Two hypotheses are proposed to account for these changes: (1) in a given cell the physiological condition of which is measurably constant the nucleus remains constant in its various parts; (2) if the physiological condition of the cell is changed, the nucleus (and its parts) increases or decreases in size and returns to its primitive condition only when the original physiological conditions of the cell are restored.—*Oran Raber.*

3337. Maige, A. **Variations du noyau pendant la digestion de l'amidon, à diverses températures, dans la cellules de la pomme de terre.** [**Variations of the nucleus during the digestion of starch, at different temperatures, in the cells of the potato.**] Compt. Rend. Soc. Biol. **89**: 170–172. 1923.—During the digestion of starch in the potato, the nucleus varies in size from 20 to 30 μ between the temperatures of 34 and 11°C. The nucleolus between these same temperatures varies in size from 5 to 9μ.—*Oran Raber.*

3338. Mainx, Felix. **Über künstliche Beeinflussung des Kernteliungsvorgangs. (Vorläufige Mitteilung.)** [**Artificially influencing nuclear division.**] Ber. Deutsch. Bot. Ges. **41**: 352–354. 1923.—In this attempt to induce amitosis in normal nuclear division by the use of poisons, epithelial cells from the mouth of *Salamander maculosa* larvae, and staminate hairs of *Tradescantia* were put in solutions of chloral hydrate and alkaloids, and then stained. The spindle fibers disappeared, and the chromosome arrangement was disturbed. With stronger solutions the chromosomes disorganized and the nuclei went into the resting stage. In the diaster stage 2 nuclei formed in the same cell and fused. No definite relations between the physical chemical properties of different materials and their effect on mitosis was established

in a study of roots of *Zea*, *Pisum*, and *Vicia*. Ether and butyl alcohol in weak solution quadruple the rate of division.—*Hally Jolivette Sax.*

3339. Martiis, Luigi Cognetti de. **Lo spermio della Phoenocora jucunda Cogn. [The sperms of Phoenocora jucunda.]** Arch. Zellf. **17**: 165–166. *1 fig.* 1923.

3340. Metcalf, Maynard M. **Comparisons of protozoan nuclei.** [Abstract.] Anat. Rec. **26**: 352. 1923.

3341. Metz, C. W. **The prophase association of chromosomes in triploid individuals of Drosophila melanogaster.** [Abstract.] Anat. Rec. **26**: 346–347. 1923.

3342. Muller, H. J. **The micro-manipulation of light waves in treating cell organs and in isolating cells.** [Abstract.] Anat. Rec. **26**: 348. 1924.

3343. Osawa, I. **Cytological and experimental studies in Morus, with special reference to triploid mutants.** Bull. Imp. Sericult. Exp. Sta. Japan **1**: 317–369. 1920.—Fixations were made with acetic alcohol (1 to 3). Seven species and 45 clonal strains of *Morus* had 14 pairs of chromosomes; 40 other clonal strains had 42 somatic chromosomes. The diploid plants were fertile, while the triploid produced very few seed. The somatic chromosomes were short, 1 pair being large and hour-glass shaped. The diploid reduction division was regular. The triploid plants grew vigorously, but were almost always sterile. Fourteen bivalents were sometimes seen. Some of the univalents were attached to the bivalents, and some of the rest seemed to disappear, so that the number of univalents did not reach 14 in any case. The number of daughter chromosomes did not reach 42 after the 1st division. In the 2nd division the chromosome number varied from 17 to 23. The 3 large chromosomes segregated 2 to one side and 1 to the other at the 1st division. In 1 clone, 42 separate chromosomes were found at the first metaphase, there being no pairs, 42 chromosomes went each way, and the division was an equational one. A few pollen-grains of some triploid clones germinated, from 0 to 4%. One triploid was the result of hybridization. The nuclei of pollen-mother-cells of diploid and triploid plants were, in volume, as 1 to 1.8.—*John Belling.*

3344. Painter, Theophilus S. **Sex-determination in monkeys.** [Abstract.] Anat. Rec. **26**: 347. 1923.

3345. Painter, Theophilus S. **The fate of the chromatin-nucleolus in opossum spermatogenesis.** [Abstract.] Anat. Rec. **26**: 349. 1923.

3346. Policard, A., et G. Mangenot. **Sur l'état de l'huile dans la cellule de réserve des graines oléagineuses. La graine en germination. [On the condition of the oil in the storage cells of oily seeds. The seed during germination.]** Compt. Rend. Acad. Sci. Paris **177**: 346–348. *Fig. 1–3.* 1923.—The authors seek to substantiate their former claim that the oil in the ripe seed of *Ricinus* contains the cytoplasm in the form of an emulsion, and that the oil is not contained within the cytoplasm as Dangeard maintains [see Bot. Absts. 13, Entry 3326]. During germination, under the double influence of diminution in oil and increase in water, the colloidal equilibrium is modified, so that the oil containing the cytoplasm becomes transformed into oil droplets in the cytoplasm. That is, the oil passes from the continuous phase into the discontinuous, the reverse of what happens in seed formation. The distribution of the cytoplasm in the oil, as is found in the ripe ungerminated seed, is called by Tschirch an "ölplasma," and occurs pathologically in animals.—*C. H. Farr.*

3347. Politis, Jean. **Sur l'origine mitochondriale des pigments anthocyaniques dans les fleurs et dans les feuilles. [On the mitochondrial origin of the anthocyanic pigments in flowers and leaves.]** Compt. Rend. Acad. Sci. Paris **177**: 137–138. 1923.—This study of the flowers of *Melia Azedarach*, *Dracunculus vulgaris*, *Biarum tenuifolium*, and leaves of *Brassica oleracea*, and *Botrytis asparagoides violacea*, confirms the early work (1911) of the author that the cyanoplasts contain a pigment derived from tannins, and Guillermond's observations that the cyanoplasts are developed from mitochondria. In *Melia* the stamen filaments fuse to form a tube, and contain a violet pigment consisting of anthocyan dissolved in the vacuolar sap. In the epidermal cells of the tube one can follow the development of the anthocyan from mitochondria. The chondriome consists of a great number of slender elongated flexuose chondriocontes and some granular mitochondria. The elements of the chondriome thicken little by little and become impregnated with the violet pigment; they then take on the form of dumbbells, the ends of which separate by the rupture of the slender middle piece. These 2 bodies

then fuse to form the spherules of the cyanoplast. The spherules enlarge and then are dissolved in the vacuolar sap giving it a uniform violet coloration. The pale red tint of *Dracunulus* is elaborated in the same manner as the violet pigment of *Melia*. The pigments of the species of *Biarum* and *Brassica* studied are also formed in the same way.—*C. H. Farr.*

3348. Politis, Jean. **Sur la formation d'un glucoside (saponarine) au sein des mitochondries. [On the formation of the glucoside, saponarine, in the mitochondria.]** Compt. Rend. Acad. Sci. Paris **177**: 280–282. 1923.—With KI, daphnine takes a rose tint at first becoming red carmine and finally reddish brown; saponarine takes a violet tint, becoming blue. In *Thymelaea hirsuta* and *T. Tartonraia*, with evergreen leaves, the development of mitochondria and the appearance of saponarine were studied, saponarine being formed in the mitochondria in much the same way as are the anthocyans [see preceding abstract].—*C. H. Farr.*

3349. Sands, Harold C. **The structure of the chromosomes in Tradescantia virginica L.** Amer. Jour. Bot. **10**: 343–360. *2 pl., 9 fig.* 1923.—Material was prepared chiefly by the aceto-carmine method of Belling. Descriptions are confined, in the case of pollen mother-cells, to stages from diakinesis to the formation of the equatorial plate; and in both mother-cells and somatic cells, to those stages after complete separation of the chromosomes has been effected. The chromosome consists of a series of granules or chromomeres, variable in number and embedded in linin. These chromomeres also vary in shape and are made up of smaller elements which, in turn, may be further subdivided. The chromatic thread is not ribbon-like but essentially cylindrical. The chromomeres are apparently arranged just inside the periphery of this cylinder, the surface of which may be smooth or irregular and the axis of which is clear. The chromomeres are usually arranged in 4 rows along the chromosome and the individual members of these rows may be opposite or disposed in an irregular spiral. The author compares his results with those of other workers and concludes that the distinction between chromatin and linin is universally valid, the chromatin representing the disperse phase and the linin the continuous phase of a 2-phase colloidal system.—*E. W. Sinnott.*

3350. Schaede, R. **Über das Verhalten von Pflanzenzellen gegenüber Anilinfarbstoffen. II. [On the behavior of plant cells toward analin dyes.]** Ber. Deutsch. Bot. Ges. **41**: 345–351. 1923.—Employing root hairs of *Hydrocharis Morsus ranae* the author used the following dyes in both distilled and running water: Naphthole, 0.0002% sol.; Prune pure, 0.001% sol.; Gallocyanin M. S., Brilliantcresylblau, 0.0001 and 0.0002%; Naphtholblau, 0.0001%; Niblau S., 0.0001%; Neumethylenblau, 0.0001%. The reactions show that the dyes are poisonous in different degrees; in general they are less poisonous in running water, due to the contained lime, which has a tendency to combine with the dye and to render it less poisonous. None stained the living plasma; some, in distilled water, stained the plasma membrane for a short time; some stained the cell sap. The coloration of the living plasma with Chrysodin, which may be combined with other colors, may have a practical bearing. The vital coloration in this case lasts only 2 hours. [See also Bot. Absts. 12, Entry 6613.]—*Hally Jolivette Sax.*

3351. Schleip, W. **Die Wirkung des ultravioletten Lichtes auf die morphologischen Bestandteile des Ascariseies. [The effect of ultra-violet light upon the structural constituents of the Ascaris egg.]** Arch. Zellf. **17**: 289–367. *Pl. 15, 24 fig.* 1923.—An electric spark 1.8 mm. in length, passing between the magnesium electrodes of an induction coil, was used as the source of illumination. The light was passed through a quartz prism and dispersed, and the rays in the region of the magnesium line at ca. 280 $\mu\mu$ were used. By means of a condensor and a specially constructed diaphragm manufactured by Zeiss, the field illuminated could be made to vary in shape and size down to a square 8 μ on a side, though the size of the field mostly employed was $14\mu \times 14\mu$. The light intensity obtained with this apparatus was very great. Eggs at different stages previous to the 1st division, as well as 2-celled embryos, were variously exposed to the light. In general, nuclei were much more sensitive to the rays than was the cytoplasm. Cells in which the cytoplasm alone was subjected to exposures up to 2 minutes in length developed into normal worms, whereas cells in which one or both pronuclei were exposed more than 5 seconds failed to develop normally. In centrifuged eggs the region containing the pigmented granules was little affected, most cells developing normally after this region had been exposed up to 4 minutes (although exposures of 1-4 minutes cause some delay in development). The clear cytoplasm in such cells, and the region of accumulated yolk

ingredients, were more sensitive, the cells failing to develop normally if these regions were exposed more than 30 seconds. The centrosome and spindle proved comparatively insensitive to the rays. Exposed cells were also studied cytologically. Chromosomes were found to develop and separate irregularly in the 1st division, some of them tending to be eliminated through such irregularity. In the 2nd division a fragmentation of the chromosomes took place. These effects on the chromosomes were seen not only when the nuclei were exposed for sufficient periods, but also when the cytoplasm alone was sufficiently exposed.—*Ralph E. Cleland.*

3352. Seussenguth, Karl. [Rev. of: Meyer, A. **Morphologische und physiologische Analyse der Zelle der Pflanzen und Tiere. Erste Teil: Allgemeine Morphologie der Protoplasten. Ergastische Gebilde. Zytoplasma. (Morphological and physiological analysis of the animal and plant cell. Part 1: General morphology of protoplasts. Ergastic formation. Cytoplasts.)** *xx + 629 p., 205 fig.* Gustav Fischer: Jena, 1920.] Biol. Centralbl. **40**: 567–568. 1920.

3353. Roskin, Gr. **Die Cytologie der Kontraktion der glatten Muskelzellen. [Cytology of contraction of smooth muscle-cells.]** Arch. Zellf. **17**: 368–381. *Pl. 16.* 1923.—A comparative cytological study was made of the contractile myonemes of certain infusoria, the contractile stalk of *Vorticella*, the muscle fibrils of certain coelenterates, and the smooth muscle fibers of certain mollusks, echinoderms, worms, and vertebrates. Similarities are pointed out between the contractile fibers of protozoa and unstriated muscle fibers of higher animals. Contraction is due to the "kinoplasm" of the cell, and not to intracellular fibrils, which, when found, are merely structural or skeletal elements. The smooth muscle cell is not a simplified form of cross-striated cell, but a special distinct type of contractile cell.—*Ralph E. Cleland.*

3354. Tamura, Oto. **Morphologische Studie über Chromosomen und Zellkerne. [Morphology of chromosomes and nuclei.]** Arch. Zellf. **17**: 131–164. *Fig. 1–6.* 1923.—The following material was studied: young larvae and testes of *Triton*, *Salamandra maculosa*, *Cryptobranchus japonicus*, *Ascaris megalocephala bivalens;* the eggs of the last named species; the salivary glands of *Chironomus* larvae; and the root tips and anthers of *Allium cepa*. Zenker's fixing fluid was used in the main, supplemented by Herrmann's and Flemming's solutions; and for the most part stained lightly with Delafield's haematoxylin and eosin. The nucleus is made up of 2 constituents only, called by the author ecto- and endocaryoplasm. Ectocaryoplasm is a basichromatic, plastic, somewhat fluid, non-granular substance, resistant to the digestive action of a pepsin and HCl mixture. It is to be identified with "chromatin," "linin," and "plastin," all of which the author considers to be identical. Endocaryoplasm is an oxychromatic semi-fluid, and is the same as the "nucleolar substance" of other authors. It is digested by pepsin and HCl. All nuclear structures are composed of these 2 substances, which are passed on from nuclear generation to generation, whether the division be somatic or heterotypic. Chromosomes have a double structure, being sacs with an outer basichromatic sheath (ectocaryoplasm) and an inner oxychromatic portion (endocaryoplasm). In resting stages the net-knots show the same structure, and the fine anastomozing threads are conceived of as ectocaryoplasmic tubes through which the endocaryoplasm may flow. There is no chromosome individuality. Nucleoli are merely enlarged net-knots. There is only a thin basiphilous sheath, the interior being oxyphilous. Nucleoli are formed from the chromosomes in telophase and reabsorbed into them in prophase. The nuclear membrane is basichromatic, and is formed by the spreading and fusion of the distal ends of fine threads put out from the chromosomes. Its disappearance in late prophase is due to its reabsorption into the body of the chromosomes. Special sections of the paper are devoted to the structure of the spermatozoon nucleus in *Ascaris megalocephala bivalens*, the middle piece of the sperm of the Urodela, and the nuclear structure of the salivary gland cells of *Chironomus* larvae. In the developing spermatocytes of *Ascaris*, the condensing chromosomes do not reveal the distinction between ecto- and endocaryoplasm, but this is due to the fact that the condensation is not a thickening, but rather a compact crumpling together of narrow threads, which do not unfold until the sperm has entered the egg. The middle piece of the sperm of the Urodela has nothing to do with the centriole, but is the endocaryoplasm of the nucleus, which becomes squeezed out when the network becomes solidly pressed together to form the head. In the nuclei of the salivary gland

cells of Chironomus larvae, the "thick threads" are shown to be made up of spirally twisted fine threads, which are considered to represent not chromatin merely, but an entire spireme, consisting of both ecto- and endocaryoplasm.—*Ralph E. Cleland.*

3355. Taylor, C. V. **Demonstration of the function of the neuromotor apparatus in Euplotes by the method of microdissection.** Univ. California Publ. Zool. **19**: 403–470. *Pl. 29–33, 2 fig.* 1920.—The neuromotor apparatus has been studied in flagellate and ciliate protozoa. In flagellates there is a complex of flagella, basal granules, rhizoplast and fibrils, centered in the centrosome on the nuclear membrane. In ciliates there is a system of fibrils connecting the motor organelles and centering in the motorium, which lies in the cytoplasm and is not connected to the nucleus. The neuromotor apparatus of the ciliate *Euplotes* has been described by Yocum (1918). It consists of fibers connecting the membranelles, the lattice work structure in the oral lip, and the five anal cirri to a bilobed body in the extreme anterior right of the animal. There are fiber plates contiguous with the basal plate of the membranelles, and dissociated fiber plates contiguous with the basal plates of the frontal, ventral and marginal cirri. The author experimented on cutting these fibers by means of glass needles, in a modification of the Barber instrument for microdissection, confining the organism in a small hanging drop in a moist chamber. Cutting the fibers or destroying the motorium interrupts coordination in the movements of the adoral membranelles and the anal cirri; the fibers therefore possess conductive properties.—*Harold Kirby.*

3356. Taylor, C. V. **Removal of the micronucleus in Euplotes.** [Abstract.] Anat. Rec. **26**: 376. 1923.

3357. Tchang, Li Koue. **Sur quelques particularités de l'évolution des plastes pendant la germination des graines de Légumineuses. [Some characteristics of the evolution of the plastids during the germination of leguminous seeds.]** Compt. Rend. Soc. Biol. **89**: 530–533. *8 fig.* 1923.—Usually when reserve starch in seed is digested, there is a mitochondrial layer around each grain, which is left when the starch is digested. This layer regenerates a chondriocont which later functions again as a starch former. The author sought to determine whether the same condition obtains in seeds with large starch grains, such as the bean and pea. In the bean there is no such mitochondrial layer. In the pea some of the grains are as in the bean, without the layer, but others possess it. As the starch is digested in germination the layer increases and then elaborates small compound grains of starch. The difference between the behavior of the pea and bean is attributed to the hypogean and epigean germination respectively.—*Oran Raber.*

3358. Unna, P. G., und Henry Fein. **Zur Chromolyse des pflanzlichen Kernkörperchens. [The application of color reaction methods in the microchemical analysis of the nucleolus in plants.]** Biol. Centralbl. **41**: 495–507. 1921.—The technique involving numerous basic and acid reacting protoplasmic stains developed by Unna for microchemical analysis of nucleoproteins in animal cells was employed in a study of the plant nucleus and nucleolus, in sections of the root tip of onion and of squash seed. This chromolysis technique is found to be equally applicable in the study of animal and plant proteins and therefore offers an efficient method of microchemical analysis in investigations in plant cytology. Methods are given in detail and an elaborate table is presented showing solubility of acid and basic proteins of the nucleolus in cells of squash seed treated with certain concentrations of some 34 different reagents at given temperatures for the same time period.—The nucleolus of the squash seed cells is of an uniform structure and with an acid protein of cytose; the animal nucleolus possesses a nuclein-containing sheath showing a globulin content. The protein ground substance of the squash seed nucleolus on the contrary appears to consist of 2 basic reacting proteins.—*William L. Bray.*

3359. Zweibaum, Jules. **Sur la coloration des graisses dans la cellule vivante. [The staining of fats in the living cell.]** Compt. Rend. Soc. Biol. **89**: 254–255. 1923.—A method of vital staining is described especially useful for Protozoa, yeast cells, etc.—*Oran Raber.*

3360. Zweibaum, Jules. **Sur l'utilisation du mélange "nadi" et du bleu d'indophénol, formé in vitro, en technique histologique: coloration intra-vitale et post-vitale des graisses. [The use of "nadi" mixture and indophenol blue, formed in vitro, in histology: intravital and post-vital staining of fats.]** Compt. Rend. Soc. Biol. **89**: 256–258. 1923. [See preceding abstract.]

3361. Zweibaum, Jules, et G. Mangenot. **Application à l'étude histochimique des végétaux d'une méthode permettant la coloration vitale et post-vitale des graisses de la cellule animale. [Application to the microchemistry of plants of a method of vital and post-vital staining of fats in animal cells.]** Compt. Rend. Soc. Biol. 89: 540–542. 1923.—Indophenol blue obtained in a nascent state by a mixture of alpha-naphthol and dimethylparaphenylene-diamine (the "nadi" mixture) is an excellent vital stain for fatty materials. Fats in general are stained a deep blue, the essential oils a violet rose, suberin and cutin a deep violet, and lignin a very pale blue. Reasons are given for its superiority over other stains.—*Oran Raber.*

ECOLOGY AND PLANT GEOGRAPHY

Geo. D. Fuller, *Editor*

(See also in this issue Entries 3258, 3573, 3583, 3584, 3595, 3816, 3827, 3830, 3908, 3910, 3915, 3920, 3922, 3927, 4000, 4033)

GENERAL, FACTORS, MEASUREMENTS

3362. Bates, Carlos G. **Physiological requirements of Rocky Mountain trees.** Jour. Agric Res. 24: 97–164. *7 pl., 5 fig.* 1923.—This paper, supplemental to a field study of the climatic and edaphic factors differentiating forest types of the Central Rocky Mountains, attempts to place the interpretation of the field data on a sound basis of comparative physiology. The tests reported were conducted in the laboratory with seedlings of several species, and covered the relative transpiration rates and water requirements, the drought resistance as indicated by wilting coefficients, and the resistance to excessive heat (not wholly segregated from the factor of cumulative water-loss). All transpiration tests were made with a slightly acid soil, which may not be equally favorable to absorption by all of the species considered; in this respect the results are not as comprehensive as might be desired. Considering the results broadly it appears that (1) the species differ in photosynthetic capacities and growth rates, with the shade-tolerant spruce (*Picea Engelmannii*) leading, followed by Douglas fir (*Pseudotsuga Douglasii*), lodgepole pine (*Pinus Murrayana*), and western yellow pine (*P. ponderosa*); (2) because of this greater activity under a given set of conditions the spruce has a higher sap density or osmotic pressure, which tends to reduce absolutely the transpirational water loss and the relative water requirement; (3) also because of this reduced transpiration a greater proportion of the energy of sun-light is available for photosynthesis, making the apparent heat requirements less for spruce than for other species, but also making species such as spruce and Douglas fir more susceptible to heat injury. In actual tests yellow pine and Douglas fir were found to be least injured by high temperatures and excessive drying, possibly because of their sturdy characters and deep-rooting habits. In ability to reduce the "wilting-coefficient" of the soil to a low point there is very little difference between the species, except that lodgepole pine, which is both slow-rooting and of low efficiency in photosynthesis, has the least power of absorption. Perhaps the greatest value of the paper is in pointing out the possible correlations between the various physiological requirements as thus expressed in relative terms, even though much greater refinement is desirable to establish these relations definitely. Of ecological significance is the fact that, in the region to which these results apply, the moistness of the site is much more indicative of the possibility for supporting numbers than of the demands or requirements for establishment of the individual plant, and by its effect upon density of the vegetation is more important indirectly than directly. It is thus concluded that spruce does not require a great deal of moisture, but can outgrow other species in dense stands supported by a moist soil where light and heat may be deficient.—*Author.*

3363. Chavastelon et Luquet. **Contribution a l'etude des conditions edaphiques des associations pastorales dans le massif du Mont-Dore. [Contribution to the study of the edaphic conditions of pastoral associations in the Mont-Dore region.]** Compt. Rend. Acad. Sci. Paris 177: 898–900. 1923.—In this area the forest zone between 700 and 1600 m. has been completely transformed by civilization. On the hills the forests have been cut and the land devoted to

herbs. In the valleys the meadows of *Agrostis vulgaris* have been mowed, irrigated, and improved. On the surface of the volcanic lavas there is a complex plant association tending to the reconstitution of the normal climatic association of beech grove and fir forests. *Calluna vulgaris* and species of *Vaccinium* cover the ground. Other areas are characterized by *Nardus stricta*. Tables of analysis of volcanic soils in lands with different types of vegetation are given. It is suggested that fertility would be increased by bedding with manure, partly because the ammonia would correct the natural acidity of the soil.—*C. H. Farr.*

3364. Cowles, R. P. **Salinity and density of Chesapeake Bay water.** [Abstract.] Anat. Rec. **26**: 382. 1923.

3365. Drude, O. **Die Pflanzengeographie und die Naturschutzpflege. [Plant geography and the preservation of natural conditions.]** (In: Drude, O., und B. Schorler. **Beiträge zür Flora Saxonica. IV. [Contributions to the flora of Saxony. IV.]** Sitzungsber. u. Abhandl. Naturwiss. Ges. "Isis" **1917**: 29–53. 1918.—This paper points out the several ways in which local societies can lend invaluable aid in completing a survey of the plant geography of Saxony. The author specifies 4 lines of procedure which should be followed, giving examples of each: (1) plant associations should be studied on a physiographic basis, including the role of factors and of individual species; (2) the status of relics should be determined; (3) stationary and migratory associations should be distinguished; (4) historical and prehistorical colonization of the region should be studied, including the role of man in placing natural areas under cultivation.—*A. F. Hill.*

3366. Fuller, Geo. D. **Soil as a limiting factor of forests in La Salle County, Illinois.** Trans. Illinois Acad. Sci. **12**: 99–102. 1919.—The forests in this portion of Illinois are limited to certain soils that border the streams. This is designated the yellow-grey silt loam in contrast to the brown and black silt loam of the upland, which supports only grassland. Along north-south streams the forest strip extends to about double the width on the east side of the stream.—*Geo. D. Fuller.*

3367. Fuller, Geo. D. **Topographic relief as a factor in plant succession.** Trans. Illinois Acad. Sci. **13**: 243–247. 1920.—The beech maple climax is not reached in the Michigan Sand Barrens, but occurs on nearby sand dunes, where the soil is not essentially different. The difference in rate of succession, the writer believes, is due to the presence in the dune area of sheltered mesophytic depressions, which act as centers of distribution for the more mesophytic plants.—*W. G. McGinnies.*

3368. Hirsch, Erwin. **Vorläufige Mitteilung über die Ergebnisse einer biologischen Untersuchung des versalzenen Flussgebiets der Wipper. [Preliminary report on a biological investigation of the oversalted region of the Wipper River.]** Arch. Hydrobiol. u. Planktonk. **12**: 82–121. *2. pl.* 1920.—The natural saltiness and hardness of the river was increased by the waste waters of a lime factory. Qualitative and quantitative studies of the plankton were made and the chemical composition of the water determined. Besides being affected by the chemical composition of the water, life in rivers is influenced by the swiftness of flow, and by the character of the stream bed and of the shore. The bottom and shore flora seem not to be influenced by the oversalting of the water. There is a luxurious development of diatoms in the river, which do not suffer from either natural or artificial salting. A rich fauna of naked and shelled rhizopods has developed in consequence of the abundant diatoms. Representatives of all classes of fresh water inhabitants from coelenterates to fishes are found. The fish do not seem to be injured by the waste waters of the factories. As long as there is not an overbalance of one element no injury to the fauna is evident in the Wipper from the salting.—*Harold Kirby.*

3369. List, Theodor. **Das Plankton einiger Kolke des Altrheins bei Erfelden und ein Vergleich des Kolkplanktons mit dem einiger Teiche in der Umgebung von Darmstadt. [The plankton of some pools of the old Rhine near Erfeld, and a comparison of the pool-plankton with that of a swamp near Darmstadt.]** Arch. Hydrobiol. u. Planktonk. **12**: 759–804. *11 pl.* 1920.—The pools investigated are near the headwaters of the Rhine, formed by overflows through the dykes in the 15th century and in 1883. Lists of the plankton organisms found in these pools are given, and there is a comparative account of the occurrence of *Daphne longispina* var. *cucullata* G. O. Sars in 3 of the pools, with the minor differences in each. A charac-

teristic of the composition of the plankton of these pools is its constancy, in contrast to its variability in swamps. The number of plankton organisms confined to a definite time of year is smaller than in swamps. The small pools, rich in plants and dissolved organic and inorganic substances, contain more Chlorophyceae and desmids and fewer diatoms than the large pools poor in vegetation. Cladocera are better developed in the larger pools. Cyanophyceae, important in most swamps, are of secondary importance in these pools. Diatoms are better developed in large than in small swamps, and are of importance in large pools. Chlorophyceae and desmids are more numerous in species in the large swamps than in the small, but a species never appears abundantly. These are poorly developed in large pools, but well developed in small. Peridineae are similarly developed in swamps and these pools. Volvocidae, which sometimes prevail in swamp plankton, are rare in the plankton of these. Flagellates are often abundant enough in both to determine the character of the plankton. Infusoria and Sarcodina are never important. Rotifers are better developed in swamps. Rotifers, richly developed in large swamps and pools, are irregular in occurrence and variable in abundance in small ones.—*Harold Kirby.*

3370. McDougall, W. B. **A comparison of soil temperatures in upland and bottomland forests.** Trans. Illinois Acad. Sci. **13**: 249–254. *2 fig.* 1920.—The results are based on 7 readings from an upland and lowland station in Vermilion County, Illinois. The bottomland soil averaged 2.4°F. lower at a depth of 3 inches and 2.5°F. lower at 12 inches during the period June 21–Sept. 25. The air temperatures in the lowland averaged 4.1°F. lower.—*W. G. McGinnies.*

3371. Minder, Leo. **Zur Hydrophysik des Zurück- und Walensees, nebst Beitrag zur Hydrochemie und Hydrobakteriologie des Zurücksees.** [**On the hydrophysics of Zurück and Walen lakes, with a contribution to the hydrochemistry and hydrobacteriology of Zurück Lake.**] Archiv Hydrobiol. u. Planktonk. **12**: 122–194. *Pl. 3–4, 8 fig.* 1920.—Temperature records were taken at different depths in Zurück and Walen lakes in 1905–1911. Optical observations were made of the visual depth, the light intensity as tested by the photographic plate, and the color. The transparency as well as the color is modified by the presence of phytoplankton. Chemical tests were made for the inorganic substances present in the lake at Zurück, which provides drinking water for the city. Quantitative determinations of the bacteria present in the waters are given for this lake. A periodicity was found in the presence of bacteria, due in part to the duration and intensity of the sunlight. The maximum is in winter and the minimum in summer.—*Harold Kirby.*

3372. Romell, L. G. **Voles as a factor in plant ecology.** Svensk Bot. Tidskr. **15**: 43–45. 1921.—On small islands in the archipelago of Stockholm possessing an oceanic climate voles eat the grass roots within their burrows and cause strips of Sphagnum to replace the turf. The Sphagnum is not able to resist the subsequent invasion of the grass.—*Geo. D. Fuller.*

3373. Schostler, František. **Quelques remarques sur l'organization des associations végétales et sur les méthods de recherches.** [Remarks on the organization of plant associations and on research methods.] Preslia [Rept. Czechoslovak Bot. Soc. Prague] **2**: 103–112. 1923.—The definition and characterization of plant associations according to the methods of the Scandinavian and Swiss schools are discussed. Methods are suggested for the easier determination of the quantitative and qualitative characters of associations with special attention to local distribution (répartition locale).—*Geo. D. Fuller.*

3374. Thone, Frank. **Ecological factors in region of Starved Rock, Illinois.** Bot. Gaz. **74**: 345–368. *5 fig.* 1922.—At 7 representative stations in this Illinois State Park, soil moisture, evaporating power of the air, evaporating power of solar radiation, temperature of air and soil were studied quantitatively during the 1921 growing season, with special reference to their influence on seedling growth. The results are expressed graphically. Soil moisture was found to vary seasonally and also in response to the mechanical composition of the soil, to the topography, and to the density of the foliage canopy. The evaporating power of the air and that of solar radiation were found to vary in response to the season, to the state of tree foliation, and to the topographic exposure. Temperature varied in much the same manner as evaporating power of the air. The vegetational phenomena showing correlation with the instrumental data were: (1) the density of ground cover and the number of the

tree seedlings; (2) the seasonal conditions favorable for the development of seedlings; and (3) the location of climax, sub-climax and super-climax associations.—*Geo. D. Fuller.*

3375. Visscher, J. Paul. **Studies on the fouling of ships' bottoms.** [Abstract.] Anat. Rec. **26**: 380. 1923.

STRUCTURE, BEHAVIOR, SYMBIOSIS

3376. Armitage, Eleonora. **Further notes on elm flowering.** Jour. Botany **60**: 141–142. 1922.—Supplemental notes are given of the time of flowering of elms in Herefordshire to substantiate Christy's notes on the same subject [see Bot. Absts. 12, Entry 2315]. The author concludes that the weather of the flowering month has a direct influence on the time of flowering.—*Adele Lewis Grant.*

3377. Fuller, Geo. D. **Ecology of heather.** Bot. Gaz. **73**: 502. 1922.—This is a summary of several contributions by Rayner and others which show that *Calluna vulgaris* grows best on soil neutral in reaction, that a mycorrhizal fungus is associated with germination of its seed and that this symbiosis is obligate, and that the plant will not grow on truly calcareous soils.—*Geo. D. Fuller.*

3378. Fuller, Geo. D. **Mycorrhiza of forest trees.** Bot. Gaz. **73**: 506. 1922.—This gives a summary of work by McDougall, Melin and others to the effect that the importance of mycorrhiza for forest trees may vary greatly.—*Geo. D. Fuller.*

3379. McDougall, W. B. **Symbiosis in a deciduous forest. 1.** Bot. Gaz. **73**: 200–212. *3 fig.* 1922.—A forest in Champaign County, Illinois, dominated by *Acer saccharum* and *Ulnus americana* was the field of investigation. The climatic conditions are summarized, the uniform neutrality of the soil determined, and 216 hundred-foot quadrats mapped for trees and surveyed for other plant life. The list of species shows a plant population of 31 trees, 12 shrubs, 6 lianas, 134 herbs, 5 ferns, and 83 higher fungi. Social disjunctive symbiosis or that in which the organisms concerned are not in actual contact is discussed and examples are taken from the area under investigation.—*Geo. D. Fuller.*

3380. Pool, Raymond J. **Xerophytism and comparative leaf anatomy in relation to transpiring power.** Bot. Gaz. **76**: 221–240. *Pl. 20–23.* 1923.—Using the "tripartite slips" (cobalt paper with 2 permanent blue standards mounted on opposite sides) the author listed the transpiring power of many types of plants in the region of Pikes Peak, Colorado. His results do not agree with those of Bakke, who suggested that plants with a foliar transpiring power of less than 0.30 be regarded as xerophytes. The writer would place the line between the xerophilous and mesophilous species at 0.9088. In connection with these studies, he concludes that "There is not as great a degree of correlation as would be expected between the relative xerophytism of the habitats in question and the index of transpiring power of various species of plants more or less characteristic of the sites under investigation." In general, the histological work revealed a definite correlation between tissue structure and place in the table of transpiring power indices, but the degree of correlation, it is stated, is not as high as an enthusiast for this method might desire. "The degree of correlation between habitat xerophytism and leaf anatomy and transpiring power as recorded by this method is rather low and uncertain." In attempting to discover the weakness of the method, the author suggests that it lies in not taking account of the stomatal activities.—*B. W. Wells.*

3381. Robertson, Charles. **Flowers and insects. XXI. Data of anthecology.** Bot. Gaz. **73**: 148–152. 1922.—This is a discussion of the proper presentation of data and includes criticism of the work of Knuth and Müller.—*Geo. D. Fuller.*

3382. Tams, W. H. T. **The pollination of early spring flowers by moths.** Jour. Botany **60**: 203–205. 1922.—Walter Christy concluded that night flying moths are the chief pollinating agents in primroses. He asked for information concerning the tongue lengths of the 35 species of moths found in Great Britain from March to May. The present paper gives the desired data. The method of procedure is given in detail, also a tabulated list of the information gained. Four of the species examined, *Calocampa exoleta, C. vetusta, Cucullia verbasci* and *Phlogophora meticulosa,* have tongues long enough to penetrate the deep primrose corolla tubes; all are abundant throughout Great Britain but only *Cucullia verbasci* has ever been observed visiting a primrose.—*Adele Lewis Grant.*

VEGETATION

3383. Clark, Mary G. **Skunk Cabbage (Lysichiton kamtschatcensis) on the Mendocino coast.** Madroño 1: 99–100. 1923.—The plants grow in still water and the flower stalk wilts letting the seed into the water. The substance inclosing the seed swells making a gelatinous mass.—*Roxana Stinchfield Ferris.*

3384. Drude, O., und B. Schorler. **V. Formationscharakter und floristische Grenzen des vogtländisch-ostthüringischen Schiefergebirges.** [The character of the formations and the floristic groups of the slate mountains of Vogtland and eastern Thuringia.] In: **Beiträge zur Flora Saxonica.** [Contributions to the flora of Saxony.] Sitzungsber. u. Abhandl. Naturwiss. Ges. "Isis" 1918: 31–64. 1919.—A discussion of the general physiographic and geological features of the region is followed by a more detailed account of 2 areas. The mountain peaks and diabase valleys of the upper Saale are considered with special reference to the wood and fell formations. The plateaus to the east of the Saale and the valley ponds of Plothen are described and the following formations distinguished: woods, fields, meadows, dry hills, and aquatic. In the latter group several associations are recognized such as reed, *Litorella, Carex cyperoides,* floating and submerged aquatics, and river bank.—*A. F. Hill.*

3385. Frey, E. **Die Vegetationsverhältnisse der Grimselgegend im Gebiet der zukünftigen Stauseen.** [The vegetation of the Grimsel region.] Mitteil. Naturf. Ges. Bern 1921: 85–281. *9 pl., 5 fig., map.* 1922.—The district investigated embraces about 150 square km., of which 45.4% is glacier and snow field, 49.6% rock and glacial till, and only 3.9% lies below 1800 m. The non-calcareous granite-gneiss area supports a relatively poor flora of 400 species. The vegetation may be divided into 45 associations, including the lichen-moss communities which are here for the 1st time considered sociologically. The 1st part of the paper contains abundant statistical material organized in tables. Associations are defined according to their characteristic and constant species. The lichen-moss communities are treated in a similar way. In the genetic-dynamic section the vegetation is classified topographically, special attention being given to successions on rocks where lichens play an important rôle in the initial stages. They are able to dissolve the mineral constituents of the rocks, especially the feldspar and mica, and thus release the quartz particles. The succession of vascular plants in the rock crevices is more rapid than that of the lichen-moss association on the rock surfaces. On the 3 principal glacial-alluvial soils a most varied morainic and sand vegetation occurs exhibiting all phases from the initial to the final. Here, too, are mixtures of the snow vegetation with that of the subalpine since in closely adjacent areas the ecological factors show extraordinarily sharp contrast. The successions which begin upon rocks and gravel develop at different altitudes into the same association; therefore the altitudinal zones may be designated, according to Lüdi, after their respective associations,—Rhodoretum zone, Nardetum zone, Curvuletum zone, and snow zone.—*E. Frey.*

3386. Fuller, Geo. D. **Plant sociology.** Bot. Gaz. 76: 110–112. 1923.—This is an account of the segregation of this phase of ecology and of progress in the direction of making it a separate branch of biological science. It includes a critical summary of the contributions of Harper, Pavillard, Braun-Blanquet and others together with some comment on certain of the terms and concepts in use.—*Geo. D. Fuller.*

3387. Fuller, Geo. D., and P. D. Strausbaugh. **The forests of La Salle County, Illinois.** Trans. Illinois Acad. Sci. 12: 246–272. *5 map.* 1919.—This ecological survey covers an area of 440 square miles of which 12.5% was originally and 2.3% is now actually covered with forests. The principal associations are the upland mesophytic oak, the dry oak, the mixed, and the bottom or flood plain forests. Grazing is so extensively practiced that not more than 5% of the forests have sufficient reproduction to insure their permanency. A definite correlation exists between soil type and forest distribution.—*Geo. D. Fuller.*

3388. Harvey, Le Roy H. **Yellow-white pine formation at Little Manistee, Michigan.** Bot. Gaz. 73: 26–43. *6 fig.* 1922.—This is a study of stands of 160 and 60 acres of *Pinus resinosa* and *P. strobus,* remnants of a once magnificent forest which occupied the region. Quantitative data are presented on rainfall, temperature, soil moisture, evaporation and light, together with an analysis of the life forms and frequency percentage of the vegetation according to Raunkiaer's methods. A study of the age distribution of the principal tree species

indicates that the forest had been self perpetuating for centuries but that about 2 centuries ago it had suffered almost entire destruction, possibly through fire of lightning origin. The forest with its mixture of pine, *Quercus alba, Q. rubra,* and *Acer rubra* is regarded as climax.—*Geo. D. Fuller.*

3389. Johnston, R. N., and J. F. Sharpe. **Report of James Bay forest survey: Moose River lower basin.** *16 p., map.* Dept. Lands and Forests, Ontario: Toronto, 1923.—An area of 13,500 square miles was surveyed, largely by use of aircraft supplemented by the application of the strip method to selected type areas, and an estimate was made of the forest resources. Some 67% of this area constitutes a belt of low, poorly drained land adjacent to James Bay with the remainder in the better drained northern clay belt. About 17% of the entire area possesses tree growth of pulp wood size, more than ¾ of this being in the clay belt. The important tree species are *Picea canadensis, P. mariana, Abies balsamea, Pinus Banksiana,* together with scrubby *Larix laricina* and *Thuja occidentalis. Populus tremuloides* and *P. balsamifera* occur along the streams but suffer so severely from heart rot as to be nearly worthless. The entire pulp supplies are estimated at 9.6 million cords of black spruce, 1.6 of white spruce, 1.4 of balsam fir. The general average for the whole timbered area is 8.6 cords per acre.—*Geo. D. Fuller.*

3390. Lee, Willis T. **A visit to Carlsbad Cavern.** Nation. Geog. Mag. **45:** 1–40. *42 pl.* 1924.—The last 8 pages and 12 illustrations are devoted to the fantastic plants of the western deserts in the vicinity of Carlsbad Cavern, New Mexico.—*W. M. Atwood.*

3391. McDougall, W. B. **The forests of Vermilion County, Illinois.** Trans. Illinois Acad. Sci. **12:** 282–289. *Map.* 1919.—This is an ecological study of the character and distribution of the wooded areas in a section of Illinois that is predominatingly grassland. The chief forest associations are the oak-hickory, the beech-maple-oak, the basswood-elm, and the elm-sycamore-maple.—*Geo. D. Fuller.*

3392. Monnet. **Les forêt en Syrie et au Liban. [The forests in Syria and on Lebanon.]** La Géographie **40:** 453–459. 1923.—The area in forest in this region is estimated at 100,000 hectares with an equal area of maquis which would probably become forest with protection. Among the associations described are a maquis of live oak up to 1,000 m., forests of pine and oak up to 1,500 m., stands of cypress and juniper on calcareous areas, forests of *Quercus aegilops* and *Q. lusitanica* on fertile level areas, *Platanus, Alnus,* and *Juglans* along the streams, and sub-alpine forests of fir and cedar above 1,300 m. Three forested areas are described and the presence of a few large trees of *Cedrus* noted as the remnants of the renowned forests of cedar upon the mountains of Lebanon.—*Geo. D. Fuller.*

3393. Scherrer, Max. **Soziologische Studien am Molinietum des Limmattales. [Sociological studies of Molinietum in Limmattal.]** Ber. Zürcher. Bot. Ges. 15 [1921–1923]: 1-43. 1923.—The author used the quadrant and estimation methods to determine the sociological relationships of the vegetation, reaching the conclusion that the latter is somewhat the better. Comparing the two methods, he lists 75 species by the quadrant method as against 140 by the estimation method. He tabulates the number and constancy of the species obtained by both methods. The estimation method embraces the larger number of species, and determines the character species and the constants with less loss of time. The quadrant method has the following advantages: listing is more exact; it effects a better basis for comparison of the grades of distribution of the species and their constancy within the clan; it shows numerically the variability of the composition of small areas of the association; it makes it possible to determine the floristic homogeneity of the clan. The quadrant method is disadvantageous in that it gives an incomplete picture of the total species count of each clan as well as the association; it is absolutely unsatisfactory for characterizing the synthetic association, and for its ecological and dynamic conception.—*G. W. Friedrich.*

3394. Schmoll, Hazel M. **Ecological survey of forests in the vicinity of Glencoe, Illinois.** Trans. Illinois Acad. Sci. **12:** 208–233. *18 fig., map.* 1919.—The topography of this morainic region is carefully considered and both the hydrarch and the xerarch successions of the region are traced to climax forests of oak-hickory-ash, *Quercus alba-Carya ovata-Fraxinus americana,* or of maple-basswood, *Acer saccharum-Tilia americana.*—*Geo. D. Fuller.*

3395. Simmons, Lillian M. **Forest distribution at the ends of the Lake Chicago Beaches.** Trans. Illinois Acad. Sci. **13**: 226–239. 1920.—This is a description of the forest vegetation of the mesophytic upland, the xerophytic sand ridges, and the morainic swamps.—*W. G. McGinnies.*

3396. Steffen, H. **Zur weiteren Kenntnis der Quellmoore des Preussischen Landrückens mit hauptsächlicher Berücksichtigung ihrer Vegetation. [Further data on the spring moors of the Prussian ridge, with especial reference to their vegetation.]** Bot. Archiv **1**: 261–312. *11 fig.* 1922.—An extensive consideration of the geology and ecology of the Prussian spring moors is given. The sudden change from one plant community to that of another on the spring moors (e.g., a thick stand of *Equisetum palustre* is sharply delimited from an adjoining stand of *Hypnetum*) is contrasted with the more scattered distribution of plants on other moors.—*William Seifriz.*

3397. Waterman, W. G. **Development of plant communities of a sand ridge region in Michigan.** Bot. Gaz. **74**: 1–31. *12 fig.* 1922.—The vegetation studied occupies a region of sand ridges and ponds of various sizes which have succeeded a shallow bay of the glacial Lake Algonquin. Two successional series are recognized and described: the sand ridge and the aquatic succession. In the former the stages are the grass-shrub, the pine-oak, and the beech-maple-hemlock and in the latter they are frequently the Potamogeton, the Nymphaea, the Scirpus, the grass meadow, and the swamp forest. In some cases the aquatic succession leads through a bog-shrub stage composed largely of *Chamaedaphne, Andromeda* and *Ledum* to a bog forest of *Larix, Thuja* and *Pinus*.—There is also a discussion of the units of plant synecology and their classification.—*Geo. D. Fuller.*

FLORISTICS

3398. Fuller, Geo. D. **Notes on the distribution of the oaks and buckeye in La Salle County, Illinois.** Trans. Illinois Acad. Sci. **13**: 247–249. 1920.

3399. Holm, Theo. **Contributions to the morphology, synonymy and geographical distribution of Arctic plants.** Report Canadian Arctic Expedition 1913–18. **5**: Pt. B. *139 p., 24 fig.* 1922.—The author, considering the external morphology of the plants of this flora, emphasizes, as characteristic of Arctic vegetation, persistent, thick, primary roots or secondary fibrous roots from rootstocks, stoloniferous subterranean stems, pseudo-rhizomes, few bulbs, both low woody and herbaceous autophytic perennials with an almost complete absence of lianas, annuals and parasites. Trees of *Picea canadensis* and *Populus balsamifera* are found north of the Arctic Circle in the valleys of the Coppermine and Mackenzie rivers. The present Arctic flora is regarded as composed largely of remnants of a Tertiary Alpine flora. Of the 230 species now found in Arctic America 90 occur also in alpine habitats, 84 are circumpolar, 106 are found among the 124 known from Spitzenbergen, and 129 are common to Greenland. A detailed study of the occurrence of the species of this flora in other Arctic and Alpine regions is presented in tabular form and a very fully annotated list of species is given. The bibliography consists of 130 titles.—*Geo. D. Fuller.*

3400. Macoun, Jas. M., and Theo. Holm. **Vascular plants.** Rept. Canadian Arctic Expedition 1913–18. **5**: Pt. A. *50 p., 13 pl., map.* 1921.—This is an annotated list of the plants collected on the expedition with drawings or photographs of noteworthy species. According to this list 230 species of vascular plants are now known from the Arctic shore between Point Barrow and Bathurst inlet. The largest families are Compositae with 23 species, Gramineae with 22, Ranunculaceae with 19, Cruciferae and Saxifragaceae with 18 each, and Cyperaceae with 16, while the largest genera are *Saxifraga* with 15 species, *Carex, Salix* and *Ranunculus* each with 12, and *Pedicularis* with 7.—*Geo. D. Fuller.*

3401. Praeger, R. Lloyd. **Ireland and Switzerland: a botanical contrast.** Irish Nat. **32**: 97–113. 1923.—The author was a member of the International Phytographic excursion of 1923. The numbers, composition, and past histories of the 2 floras are contrasted. The fact that alpine plants of Switzerland are found at sea level in Ireland is discussed and other important contrasts are mentioned.—*W. E. Praeger.*

3402. R, A. B. [Rev. of: Willis, J. C. **Age and area, a study in geographical distribution and origin of species.** *x + 259 p.*, Cambridge University Press: London, 1922 (see Bot. Absts. 13, Entry 2351).] Jour. Bot. **60**: 306–307. 1922. [See also Bot. Absts. 12, Entry 5466; 13, 761, 1476, 2347.]

3403. Scharff, R. F. **Stray reflections on the Irish alpine flora.** Irish Nat. **32**: 117–120. 1923.—Swiss alpine plants are found at low levels in Ireland. During the mild and moist climate of the late Tertiary the "alpines" were distributed in the European lowlands and they were driven to the heights as the climate became more severe; here they are kept warm and dry in winter by the snow. In Siberia where the snow is deep they grow at low altitudes. "Alpine plants in fact do not tolerate extremes of temperature."—*W. E. Praeger.*

3404. Waterman, W. G. **Distribution of oaks on the Lake Chicago Bars in Evanston and New Trier Townships** [Illinois]. Trans. Illinois Acad. Sci. **13**: 239–242. *3 fig.* 1920.—*Quercus ellipsoidalis* is found along the edges of sand ridges and it appears to be a very important component of the upland forests. Forms occur that are apparently hybrids of *Q. ellipsoidalis* and *Q. velutina*. *Q. alba* occurs on the ridges, *Q. rubra* on the mesophytic slopes and *Q. bicolor* in the depressions of the morainic upland.—*W. G. McGinnies.*

APPLIED ECOLOGY

3405. Buttel-Reepen, H. v. **About the "language" of bees.** Amer. Bee Jour. **63**: 345–346. 1923.—A brief account is given of the way in which scout bees communicate to the other inmates of the hive the discovery of a new source of nectar, as described by K. v. Frisch in Ueber die "Sprache" der Bienen.—*J. H. Lovell.*

3406. Lovell, J. H. **Soils and plants.** Amer. Bee Jour. **63**: 68–70. *Fig. 1–6.* 1923.—The soils of the western states with a rainfall of 20–10 inches or less differ profoundly from those of the eastern with 60–20 inches of annual precipitation. In the former area calcium carbonate is increasing and many injurious salts as "black alkali" and "white alkali" also remain in the soil; but in the latter lime is not increasing, being removed by leaching. Alkali is detrimental to honey producing legumes, while clovers grow most vigorously and yield most nectar on limestone soils. Large areas of alfalfa have been injured by the rise of alkaline salts to the surface and sweet clover is only slightly more tolerant of alkali than alfalfa. In contrast many valuable honey plants of the heath family (Ericaceae) flourish only in acid soils.—*J. H. Lovell.*

3407. Lovell, J. H. **Soils and the honey flora of the United States.** Amer. Bee Jour. **63**: 11–13. *Fig. 1–3.* 1923.—This paper opens with a brief summary of the work of the Bureau of Soils. In the relation of soils to nectar secretion 3 general types are recognized: injurious alkali, calcareous soils, and acid soils. The influence of the chemical composition of soils may be greatly modified by temperature and rainfall.—*J. H. Lovell.*

3408. Pellett, Frank Chapman. **American honey plants, together with those which are of special value to the beekeeper as sources of pollen.** *2 ed., 392 p.* American Bee Jour.: Hamilton, Illinois, 1923.—American Honey Plants, the first book devoted to the sources of honey, did not appear until 1920. The present edition contains 100 pages of new information and 39 additional illustrations. The plants are arranged alphabetically according to their vernacular names; Latin names are also given. While thousands of angiosperms secrete a small quantity of nectar, honey production as an industry is dependent on comparatively few species, which yield nectar abundantly and are sufficiently common to permit the storing of a large surplus of honey. Including discussions of species which are of special value for pollen, the book contains about 380 articles on plants; but under many of the titles, as aster, goldenrod, maple, *Phacelia*, sage, etc., more than 1 species is described. The chief sources of honey, representing about a score of genera, are treated at length. Numerous related topics, as nectar, nectar secretion, poisonous honey, propolis, weather, etc., have likewise been included in proper alphabetical order. The honey floras of the different states are reviewed in more or less detail according to the information available, and the distribution of the species in some instances illustrated by maps. Many of the excellent photographs of flowers are natural size.—*J. H. Lovell.*

FORESTRY

W. N. Sparhawk, *Editor*

(See also in this issue Entries 3231, 3308, 3362, 3366, 3367, 3370, 3376, 3378, 3379, 3387, 3388, 3389, 3391, 3392, 3394, 3395, 3398, 3404, 3672, 3680, 3740, 3796, 3819, 3858, 3908, 3967, 3970, 3996, 4023, 4025, 4035, 4048)

3409. Anonymous. **Afforestation on [Water] Gathering Grounds.** Surveyor 64: 291. Oct. 19, 1923.—Afforestation of the catchment areas of the Bradford, England, Corporation has recently been discussed, but rejected. The ideal watershed is one which is clean and bare and from which the water can be rapidly collected. The acidity of moorland water rapidly increases when it stagnates in contact with peat, and the color, taste and quality are impaired.—*Rudolph E. Thompson.*

3410. Anonymous. **Progress report of forest research work in India for the year 1921–22 including the administration report of the Forest Research Institute, Dehra Dun.** *102 p.* Simla, 1923.—The report discusses work under way and results to date under the principal divisions of silviculture, forest botany, forest economy, forest entomology, and forest chemistry. Besides the work of the Central Institute, a great deal of experimentation is carried on by the local silviculturists. Studies of artificial reforestation seem to be particularly important. Work in forest products is expanding rapidly. A list of publications of the year is given.—*S. B. Show.*

3411. Anonymous. **The sowing of wattle seeds.** Jour. Dept. Agric. Victoria 20: 251–252. 1922.

3412. Abrego, Gilberto Serrato. **Objeto de la explotación de un pinar. La resinación de los pinos y su madera.** [Exploitation of pine forest—production of resin and timber.] México Forest. 1^{7-8}: 1–7; 1^{9-10}: 11–12. 1923.—This is a translation of a French article by R. Cattin and J. J. Saint-Jours. The management of pine forests and methods of carrying on the resin industry are described.—*W. N. Sparhawk.*

3413. Alexander, George W. **Weather and the Berkeley fire.** Monthly Weather Rev. 51: 464–465. 1923.—The relation between weather and the rapid spread of forest fires throughout California during the first part of September, 1923, is discussed.—*E. N. Munns.*

3414. Bateman, E., and C. Henningsen. **Theory of the mechanism of protection of wood by preservatives. Part IV. Experiments with hydrocarbons.** Proc. Amer. Wood Preservers' Assoc. 19: 136–144. *2 fig.* 1923.—Results are given on the toxicity of hydrocarbons, methods of working with them, and upon certain of their physical properties. The tests show that hydrocarbons of low boiling point in saturated solutions inhibit growth of *Fomes annosus*. Results of experiments upon the inhibition concentrations of benzene and naphthalene are also given. The author's conclusions are: the hydrocarbons are at least 4 times as toxic, molecule for molecule, as the corresponding phenols, i.e., benzene is more toxic than carbolic acid and naphthalene than B-naphthol; hydrocarbons which alone are not toxic enough to inhibit growth may aid materially when combined with others; in mixtures of hydrocarbons, the individuals appear to act independently, i.e., the percentage of growth of a fungus subjected to a mixture appears to be the product of the percentages of growth in the presence of each separate component.—*Walter H. Snell.*

3415. Bradley, J. W. **Report on forest administration in the Andamans for the year 1921–22.** *ii + 48 p.* Calcutta, 1923.—The report details the work of the forest office, which is under local administration. At present mixed stands are clear cut and additional selection cutting is done to obtain special woods demanded by the market. Government sawmills are commencing operations on North Island. The taungya method of agriculture and forest regeneration is being started. Nearly all exploitation is by departmental agency.—*S. B. Show.*

3416. Briggs, Z. M., Chairman. **Report of Committee 7-1—Track service records.** Proc. Amer. Wood Preservers' Assoc. 19: 152–167. 1923.—This report gives records of annual tie renewals on several railroads to show the progressive changes with increasing use of treated ties. It also gives records, from special test tracks on the C. B. & Q. R. R., for many woods

variously treated. Diagrams show the life of untreated ties ranging from 3 years for cottonwood to 8½ years for white oak, but do not include the more durable tie woods. A comprehensive record of completed service tests of ties from 1900 to 1921 is also included.—*Walter H. Snell.*

3417. Dalrymple-Hay, H., et al. **Forestry commission (New South Wales) report for year ending 30th June, 1923.** *14 p.* Sydney, 1923.—Continued progress in organization and public education is recorded. Monterey pine was planted on 1,625 acres, while thinning was done on 5,800 acres, treatment for regeneration on 41,870 acres, and 2,070 acres were prepared for planting. Imports of softwoods amounted to 143 million superficial feet, valued at £1,747,638. The area burned over was 7.9% of the 5,316,000 acres of state forests. The lumber industry was generally depressed.—*S. B. Show.*

3418. Farský, Octavianus. **Význam ptactva pro ochranu zemědělských kultur a ochranu lesa. [Significance of birds for the protection of agricultural products and forests.]** Zemědělský Archiv 3, 4. *3–18, 2 pl.* 1923.—The author notes the restriction of bird-habitats by clearing forests, draining swamps and lakes, and changing stream courses, thus causing a disturbance of the balance in nature. Cultivated crops then suffer from parasites both because they are grown in mass (which encourages the development of parasites), and because they are cultivated under (to them) unnatural conditions, which lowers their power of resistance. He recommends that birds be protected and encouraged, especially for forest protection. He cites field illustrations and results of the studies of the contents of birds' stomachs, and concludes that an increase in the number of birds would not materially increase the destruction of useful insects.—*B. Shimek.*

3419. Minchin, A. F. **Progress report of forest administration in Coorg for 1921–22.** *33 p.* Bangalore, 1923.—Large investments are being made to render accessible the forest resources, and government exploitation is increasing. Sandalwood is the principal source of revenue. Power logging is forcing concentrated fellings, in contrast to the former selection cutting. Considerable silvicultural research is under way. Fire protection was 99% successful.—*S. B. Show.*

3420. Osmaston, A. E. **Frost as a cause of unsoundness in sal.** Indian Forester 49: 539–545. 1923.—Severe frosts were experienced in many parts of northern India in 1904–05 and large tracts of sal had to be cut back. Examinations in some of these stands disclosed that 40% of the affected stems produce at least 2 well-developed leaders. Once a stem has been cut back, decay follows in nearly every case, extending down the stem at an average rate of about 6 inches a year.—*E. N. Munns.*

3421. Richards, C. Audrey. **Methods of testing the relative toxicity of wood preservatives.** Proc. Amer. Wood Preservers' Assoc. 19: 127–135. 1923.—Laboratory tests of the toxicity of wood preservatives are defended. The history of such tests is given and the methods discussed, especially that used at the Forest Products Laboratory at Madison, Wisconsin. The advantages of laboratory tests are emphasized, especially Petri dish tests with malt agar as the substrate, for determining relative toxicity. Malt agar is more satisfactory than wood flour agar.—*Walter H. Snell.*

3422. Rogers, Walter E. **Resistance of trees to ice storm injury.** Torreya 23: 95–99. *2 fig.* 1923.—The author continues his study of the ice-storm of 1922 in the Great Lakes region [see Bot. Absts. 12, Entry 378]. Over 2,000 trees of 38 species were examined within a radius of 10 miles about the northern end of Lake Winnebago, Wisconsin. The trees were classified as "large," "small," and "medium," and the amount of damage as "heavy," "medium," and "slight." *Populus deltoides* suffered the most damage, and *Catalpa speciosa* the least. The factors making for resistance to ice-storm injury are: small surface, shortness of limb, horizontal branching, flexibility of stem, strength. The effects of the storm will be apparent for many decades.—*J. C. Nelson.*

3423. Shinn, F. S., Chairman. **Report of Committee 5-2—Car material.** Proc. Amer. Wood Preservers' Assoc. 19: 245–248. 1923.—Eighty-two per cent of all timber removed from railroad cars is removed because of decay. The life of wood in cars (decking, roofs, sills, posts, etc.) has been found to be from 2–6 years for stock-car decking to 6–8 years for stock-car end posts and flat-car decking, with other classes intermediate. Treating wood entering

into these parts by the Bethel process wherever possible materially lengthens its life and reduces the annual cost to about ⅓ that of untreated material (on the basis of 16 years' life for the treated material).—*Walter H. Snell.*

3424. Smales, C. B. **Report on forest administration in Burma for the year ending March 31, 1922.** *138 p.* Rangoon, 1923.—The area of reserved forest is now 30,086 square miles, and of unclassed forests 114,622; about 53,000 still remain completely unsurveyed. New or revised working plans are needed on 11,320 square miles of reserved forest, though fair progress was made in this work. A complete summary of natural and artificial reforestation is given. Provision is made for systematic tending and thinning of plantations, which now cover 94,900 acres. It is found that burning accelerates growth by favoring the beneficial bacteria of the soil at the expense of the injurious. Fire protection is now given only to areas under natural or artificial regeneration. Where possible clear cutting is practiced; elsewhere, selection cutting of mature timber. Departmental exploitation of teak is an important activity. There are 164 sawmills, and the problem of future supply of timber is becoming acute.—*S. B. Show.*

3425. Smith, W. J., Chairman. **Report of Committee 7–9–1—Pressure treated posts.** Proc. Amer. Wood Preservers' Assoc. **19:** 53–58. *3 pl.* 1923.—Data have been collected from railroads, state departments, etc., on the length of life of untreated fence posts. No data are at hand for treated posts. The life of untreated posts ranges as follows: bois d'arc (osage orange) 20 years, catalpa and locust 18, cedar 15, chestnut 10, pine and oak 8. Large numbers of treated yellow pine posts are being used even where fire hazard is great. Fire loss in decayed untreated posts is much greater than in creosoted sapling pine posts.—*Walter H. Snell.*

3426. Soule, Roland P. **Low temperature tars and wood preservation.** Proc. Amer. Wood Preservers' Assoc. **19:** 114–127. 1923.—Low temperature tars will soon come upon the market in increasing quantities. A comparison of these with other creosotes shows that the low temperature tars have the same penetration and absorption, are more resistant to evaporation and leaching, have 100 times the toxicity of ordinary creosote, and are less corrosive upon steel, brass, and other metals. They are destined to play a very important if not predominant part in the tar industry.—*Walter H. Snell.*

3427. Telles, Adalberto de Queiroz. **Apontamentos de silvicultura. [Silvicultural notes.]** Dept. Agric. Commerce and Public Works: São Paulo, *121 p., 57 fig.* 1922.—This is a general dissertation upon the forest and forest species of São Paulo, Brazil. Forest or woodland covers 15.6% of the area. Methods of sowing, planting, and caring for plantations are described. Brief notes are given on the uses, methods of planting, and characteristics of the native and introduced trees. The genera or species treated include *Acacia, Erythrina glauca, Enterolobium, Tristania conferta, Luhea divaricata, Pithecolobium* sp., *Ceratonia siliqua, Joanesia princeps, Piptadenia macrocarpa, Centrolobium, Schinus, Nectandra, Stryphnodendron barbatimao, Myrocarpus, Tabebuia, Cabralea, Caesalpinia, Balfourodendron, Sweetia, Araucaria brasiliana, Platanus, Adenostephanus incana, Dalbergia nigra, Casuarina, Inga, Cedrela, Salix, Populus, Melia azedarach, Cupressus glauca, Eucalyptus, Pterodon, Aspidosperma, Grevillea robusta, Bombax, Tecoma, Machaerium, Hymenaea, Ormosia,* and *Astronium.*—*E. N. Munns.*

GENETICS

Orland E. White, *Editor*

(See also in this issue Entries 3253, 3254, 3332, 3343, 3560, 3575, 3703, 3795, 4000)

3428. Anonymous. **Fullvuxen hybrid mellan Crepis tectorum och C. capillaris omöjlig? [Full-grown hybrid between Crepis tectorum and C. capillaris impossible?]** [Rev. of: Babcock, E. B., and J. L. Collins. **Interspecific hybrids in Crepis. I. Crepis capillaris (L.) Wallr. ×Crepis tectorum L.** Proc. Nation. Acad. Sci. [U. S. A.] **6:** 670–673. 1920 (see Bot. Absts. 9, Entry 1295).] Bot. Notiser **1921:** 99. 1921.—*P. A. Rydberg.*

3429. Allen, B. M. **Glands and their function.** [Rev. of: Harrow, Benjamin. **Glands in health and disease.** *xiii + 218 p.* E. P. Dutton: New York, 1923.] Jour. Heredity **14:** 260–262. 1923.—The author's attempt to give a popular account of present knowledge of the

ductless glands is received, on the whole, favorably, although attention is called to a few errors of presentation, especially in discussing the pituitary.—*R. C. Cook.*

3430. Allen, Charles E. **An apparently sex-linked sporophytic character in Sphaerocarpos.** [Abstract.] Anat. Rec. **26**: 388–389. 1923.

3431. Anderson, E. G. **Maternal inheritance of chlorophyll in maize.** Bot. Gaz. **76**: 411–418. *Illus.* 1923.—A pale green striping which appeared in a single plant of an outcross family of maize proved to be maternal in inheritance. The percentage of pale green plants recovered in F_2 is not orthodox nor are the seed which give these striped plants distributed on the ear at random. The striped plants usually are obtained from seed on the border of areas giving only pale or only green seedlings. The author points out the similarity of this phenomenom to that of the mutation areas in variegated and mosaic pericarp colors. Striped plants when self or cross pollinated give green, striped and pale green seedlings in various proportions while green plants having only green progeny and pale green seedlings die. This case duplicates in maize the type of behavior observed by Correns in *Mirabilis*, Baur in *Antirrhinum*, and Gregory in *Primula*.—*J. H. Kempton.*

3432. Anderson, E. G., and R. A. Emerson. **Pericarp studies in maize. I. The inheritance of pericarp colors.** Genetics **8**: 466–476. 1923.—The commonest red pericarp colors in North American maize are divided into 2 categories, red and cherry. The factor pair for red pericarp is given as *Pp*. In combination with the *A* color factor *P* produces a red pericarp while with *a* the pericarp is brown. Combinations with *p* have only white pericarp. The factor *P* is independent of *A*, *R* and *Pl* and is linked with *br*, *ts* and *f*. The development of cherry pericarp is determined by 2 factors r^{ch}, 1 of the series of allelomorphs of the *R* aleurone factor and *Pl* the factor for purple plant color. The factor combination r^{ch} *PlA* gives cherry pericarp, r^{ch} *Pl a*, brownish pericarp, and the other combinations give white pericarp. Since r^{ch} is a member of the *R* series of allelomorphs it is linked with *g* and *l*. It is independent of *P*, *Pl* and *A*. The factor *Pl* is independent of *R*, *P* and *A*, but is linked with the factors of yellow endosperm and salmon silk.—*J. H. Kempton.*

3433. Banta, Arthur M. **Control of male-production in new and in old parthenogenetic lines of a daphnid (Moina macrocopa).** [Abstract.] Anat. Rec. **26**: 394. 1923.

3434. Banta, Arthur M., and L. A. Brown. **The sex of successive parthenogenetic broods of Moina macrocopa.** [Abstract.] Anat. Rec. **26**: 394. 1923.

3435. Barlow, N. **Inheritance of the three forms in trimorphic species.** Jour. Genetics **13**: 133–146. 1923.—The article is devoted in large measure to a refutation of the suggestion made by von Ubisch that the author's results previously published could be explained on the assumption that the 3 forms of *Lythrum salicaria* are as follows: long style $\frac{a}{a}\frac{b}{b}$; mid style $\frac{a}{a}\frac{B}{b}$; short style $\frac{A}{a}\frac{b}{b}$. This scheme would explain the fact that crosses involving either mid or short style with long style always give offspring of the 2 parental types only, in approximately equal numbers; but in the present article the author presents data which cannot be explained on the basis of the simple 2-factorial assumption. A short style plant might according to von Ubisch, also be of composition $\frac{A}{a}\frac{B}{b}$. Such a plant when crossed to one that is mid styled $\frac{a}{a}\frac{B}{b}$ would be expected to give offspring in the ratio of 1 long : 3 mid: 4 short; and this ratio is sometimes obtained. But whenever shorts are crossed to longs, mids never appear, although they would be expected, at least in those cases in which the composition of the plants is supposedly $\frac{A}{a}\frac{B}{b}$; only longs and shorts are given. There are still other objections to the simple 2-factorial scheme. Different mid-styled plants crossed to the same shorts (used as the female) gave in one case a ratio of 1 long : 3 mid : 4 long (the actual figures are 20 long : 57 mid : 63 short), and in another case, a ratio of 1 long : 1 mid : 2 short (28 long : 30 mid: 64 short). These results could not be accounted for on the simple assumption that mid style is either $\frac{a}{a}\frac{B}{b}$ or $\frac{a}{a}\frac{B}{B}$. Some of the plants gave erratic results. Thus, a short plant crossed to a mid, gave from one capsule, 12 long: 29 mid : 22 short; from another capsule, 8 long: 28 mid : 41 short. The author states that his results cannot be explained by regarding long, mid and short style as multiple allelomorphs.—*Edgar Altenburg.*

3436. Belling, John, and A. F. Blakeslee. **Distinction between primary and secondary mutants in Datura in regard to: IV. The configurations and sizes of the chromosomes in the trivalents.** [Abstract.] Anat. Rec. **26**: 390. 1923.

3437. Benedict, R. C. **New bud sports in Nephrolepis.** Genetics **8**: 75–95. *2 pl., 4 fig.* 1923.—A crested, 4-pinnate form arose from a crested, 2-pinnate form; a leaf of this sport is a small spherical mass of forking filaments. Another new form shows intensification of cresting—the 1st case in this genus. *Nephrolepis elegantissima-compacta* differs from its parent form in 3 added characteristics—dwarfing, increased division, and ruffling; certain regressive variations lose these characters separately. Cresting also appears as a unit difference; 3 sequential forms have each produced a form differing only in the addition of cresting (parallel variation). The term "saltation" is preferred by the author for "discontinuous variations of undetermined identity;" if "mutation" is to be restricted to cases of gene modification, a new term "is needed for variations due to changes in chromosome number." Orthogenesis is discussed.—*Howard B. Frost.*

3438. Blakeslee, A. F. **Distinction between primary and secondary mutants in Datura in regard to: I. Their occurence, appearance, and breeding behavior.** [Abstract.] Anat. Rec. **26**: 389. 1923.

3439. Blakeslee, A. F., and J. L. Cartledge. **Distinction between primary and secondary mutants in Datura in regard to: II. Pollen sterility and pollen dimorphism.** [Abstract.] Anat. Rec. **26**: 389–390. 1923.

3440. Blakeslee, A. F., and M. E. Farnham. **Trisomic inheritance in the Poinsettia mutant of Datura.** Amer. Nat. **57**: 481–495. *1 fig.* 1923.— This ($2n + 1$) form carries the gene for purple or non-purple in the extra chromosome. The plants can be classified with regard to this character pair in the seedling stage. Plants with this extra chromosome are strikingly different from normal diploid Daturas, and can be distinguished in most cases in 3-inch pots. Applying pollen from this trisomic to diploids, there resulted 1126 normals, and no Poinsettias. The cross of Poinsettia by Poinsettia did not differ from that of Poinsettia by normal, both giving 31% of Poinsettias. In one line of plants, 6,628 in number, 6 spontaneous Poinsettias were recorded. This trisomic regularly appears in the offspring of triploids. If A, a is any pair of factors, of which A is recognizable in the heterozygote, then if the pollen with 2 homologous chromosomes does not function (as is the case here), Aa_2 plants give progeny, the normals with the ratio 5:4, and the trisomics with the ratio 7:2. Backcrossed with pollen of a recessive, Aa_2 plants give normals, 1:2, and trisomics, 2:1. A_2a plants give progeny, normals, 8:1, and trisomics, 9:0; while the backcross gives 2:1 for normals, and 3:0 for trisomics. Aa_2 pollinated by Aa gives 2:1 in normals, and 5:1 in trisomics; while A_2a pollinated by Aa gives 5:1 in normals and 6:0 in trisomics. Also A_2a by Aa_2 gives 7:2 for normals, and 9:0 for trisomics; while Aa_2 by A_2a gives 7:2 for normals, and 8:1 for trisomics. All these, and other subordinate ratios, were proved by appropriate crosses; the deviations, in terms of the probable error, ranged from 0.1 to 3.4. Once a non-purple trisomic appeared where all purple trisomics were expected. This could well have been due to the functioning of a pollen-grain with an extra chromosome. From the 3 classes of purple Poinsettias the progeny from selfing was tested for another generation. From P_3, 33 plants were tested, from P_2p, 166, and from Pp_2, 153 plants, both normals and trisomics. The results agreed closely with the calculated figures.—*John Belling.*

3441. Blakeslee, A. F., John Belling, and M. E. Farnham. **Inheritance in tetraploid Daturas.** Bot. Gaz. **76**: 329–373. 1923.—True tetraploids have 4 homologous chromosomes in each set. Pseudotetraploids have a deficiency in 1 or more sets, balanced by corresponding excesses in other sets. Most true tetraploids have broader leaves and more globose capsules than diploids, but in some lines they are not so distinct. The pollen-grains of tetraploids have nearly 1¼ the diameter of those of diploids. The plants set fewer seed than diploids. True tetraploid Daturas have from ¼ to ½ of the pollen-mother-cells showing non-disjunction, with a 23 + 25, etc., distribution of chromosomes. However, this would be negligible, with regard to any 1 gene, in F_2 or a backcross. Six proved tetraploids have arisen in cultures, 5 appearing in 1 season. One of these tetraploids arose in F_1 of a cross between diploids differing in 2 pairs of genes. The tetraploid had both genes of each parent double; this excluded apogamy. Another tetraploid arose from an F_1 plant heterozygous in 2 factors. The

tetraploid was heterozygous for 1, and homozygous for the other factor; this excluded the union of 2 non-reduced gametes. Triploids have not been observed to arise spontaneously in *Datura*. Crosses of diploids by pollen of tetraploids have not produced offspring. Crosses of tetraploids by pollen of diploids gave, in 2 seasons, out of more than 278 pollinations, 27 seedlings. Of these, 7 were triploids, and 12 were diploids. The 2 pairs of factors which could be sharply distinguished are those for purple and non-purple (flower, etc.), and for spiny and smooth capsules. The 2 factors for many and few nodes give a rather wide range of errors in classification, and are not included. If A, a represent any factors, of which A can be recognized in the heterozygote; then in the tetraploids: the progeny of Aa_3 gives a 3:1 ratio; backcross of Aa_3, a 1:1 ratio; progeny of A_2a_2, a 35:1 ratio; backcross of A_2a_2, a 5:1 ratio; and the cross of Aa_3 and A_2a_2 gives an 11:1 ratio. No recessives should occur in the progeny of A_3a, or in its backcross. In 2 races of tetraploid Daturas, these ratios were attained with regard to purple and non-purple, with deviations varying from 0.2 to 2.1 × the probable error. (However, 1 plant selfed gave 414 purple to 39 non-purple, and 415 spiny to 38 smooth, instead of the 35:1 ratio which was expected.) These results were confirmed in another race of tetraploids, the total individuals recorded being about 37,400. With regard to the inheritance of spiny and smooth capsule, there regularly appeared, in certain cases, an excess of recessives, up to 2%; recessives even appearing where none were expected. Similar exceptional recessives are produced by the $(2n + 1)$ plants with 3 factors for spiny or smooth; though none come from the $(2n + 1)$ plants with 3 factors for purple and non-purple. The dihybrid ratio was: 1,696 purple-spiny: 58 purple-smooth: 63 non-purple-spiny: 1 non-purple-smooth. This probably does not differ significantly from the calculated proportion.—*John Belling.*

3442. Boas, J. E. V. **Nogle nye Tilfaelde ap polydactylie hos Hesten. [Several new cases of polydactyly in horses.]** K. Vet. og. Landbohøjsk. Aarssk. **1922:** 66–84. *20 fig.* 1922.—The author describes the anatomy of 3 cases of polydactyly. One was clearly due to a doubling of the rudiment of the right foot; the other 2 were of the usual atavistic type.—*Sewall Wright.*

3443. Bodine, Joseph H., and Paul R. Orr. **Physiological studies on respiratory metabolism. I. Hereditary differences in respiratory metabolism of two stocks of Drosophila.** [Abstract.] Anat. Rec. **26:** 363–364. 1923.

3444. Börngen-Norden. **Ein Beitrag zur Frage: Werden erworbene Eigenschaften vererbt? (A contribution to the question: Are acquired characters inherited?]** Jahrb. Wiss. u. Prakt. Tierzucht **15:** 125–162. 1922.—Brief reviews are presented of the theories of Lamarck, Weismann, Darwin, the theory of determinants, Semon's mneme theory, Rignano, and others. Many well-known cases supporting and opposing the idea of inheritance of acquired characters are given. The idea of Spencer's "physiological units," Haacke's "equilibrium plus the gemmae hypothesis" and various others are briefly presented. Kammerer's work is discussed at greater length.—*Helen D. Hill.*

3445. Brewbaker, H. E. **Self-fertilization in rye.** [Abstract.] Anat. Rec. **26:** 384. 1923.

3446. Brink, R. A., and J. H. MacGilvary. **Segregation for the waxy character in maize pollen and differential development of the male gametophyte.** [Abstract.] Anat. Rec. **26:** 387–388. 1923.

3447. Buchholz, J. T., and A. F. Blakeslee. **Differences in the growth of male gametophytes of the chromosomal mutants of Datura.** [Abstract.] Anat. Rec. **26:** 391. 1923.

3448. Castle, W. E. **Genetic studies of rabbits and rats.** Carnegie Inst. Washington Publ. 320. *55 p., 2 pl., 7 fig.* 1922.—Part I: Size inheritance in rabbit crosses. Data from body weight, ear length, and 6 bone measurements are given in 21 pages of tables from the P_1, F_1, and F_2 generations of crosses between the large Flemish race and the small Himalayan and Polish races of rabbits. The general results may be described as typical "blending" inheritance with heterosis in F_1 and increased variability in F_2. Correlations between various measurements in the same individual are so high that the conclusion is reached that all size features are affected by the same agencies. Estimates on number of size factors, or linkage systems, based on Wright's formulas, lead to the conclusion that all chromosomes are concerned in size inheritance; this would account for the failure to find any linkage between known genes and size. Part II: On a non-transmissible tri-color variation in rats. Pig-

mented areas of a gray hooded rat were mottled with yellow patches. No mottled offspring were obtained in hundreds from F_1 and back-cross matings. The possible origin and significance of this condition is discussed in relation to the mosaic genes in maize and spotted mammals.—*E. C. MacDowell.*

3449. Chiaromonte, A. **La statura della canapa. [The size of hemp.]** Staz. Sper. Agrar. Ital. 55: 421–433. 1922.—A discussion of the multiple factor explanation of stature in organisms is followed by a recommendation of genetical study into the causes of height in hemp. The present paper is a biometrical study of various varieties. The cultural varieties Carmagnola, Bolognese, Ferrarese are regarded as distinct and homogeneous, based on the constancy of mode and the development of frequency polygons. They show no degeneration upon reproduction in Campania. Careful cultivation with accurate seed collection are recommended as means of maintaining characters in purity. In general, foreign races such as Pelosella, Tekrouri and the Commune hemp of France are superior, although Pelosella parallels the Italian varieties in height.—*Helen D. Hill.*

3450. Christie, W., und C. Wriedt. **Die Vererbung von Zeichnungen, Farben und anderen Charakteren bei Tauben. [The inheritance of patterns, colors and other characters in pigeons.]** Zeitschr. Indukt. Abstamm.- u. Vererb. 32: 233–298. *5 pl.* 1923.—This paper covers rather extensive investigations on the inheritance of pigeon characters. Tumblers, self colored × Petenten with wing bows pigmented gave in F_1 all self colored (37 offspring). The F_2 gave 29 self, 3 with wing bows pigmented. F_1 back-crossed on Petenten gave 10 self, 10 with white head and 24 with pigmented wing bows. The authors interpret the back-cross ratio as indicating that a recessive factor, *p*, for white head, neck, abdomen and breast is operating with another recessive factor, *k*, for white head only. The failure of the white head class to appear and the excessive number of selfs in F_2 is assumed to be due to experimental error. The factor *p* is further assumed to be linked with a factor called S_1 for white tail.—Danish with white wings and abdomen × self colored carrier pigeon gave in F_1, 6 offspring all self. Two F_1 birds back-crossed on the Danish gave 5 self colored and 3 with white wings and abdomen, 1 doubtful. Probably there is but a single factor difference in the 2 color patterns.—Petenten with black wing bows × Danish with white wing bows and abdomen gave in F_1 a color pattern similar to that of the Danish with the addition of color to the wing bows as in the Petenten. Color was dominant to lack of color. The F_1 was back-crossed on the Danish. The offspring had colored heads, necks, breasts, backs and tails. There were 11 with colored wing bows and 12 with white wing bows. The factor *k* for white head was also present and the back-cross ratios were: 4 self: 2 white head: 16 black wing; the expectation was 5.5:5.5:11. Coupling was again shown between black wing color and white tail. The genes for these characters gave a cross-over percentage of 27.6 and 29.7%, respectively, in ♂ and ♀. The F_2 generation in the Petenten × Danish cross gave 15 self: 2 white head: 5 white; expected, 12.375:4.125:5.5. White tail factor s_1 for white tail in the Petenten is recessive to its normal allelomorph for colored tail. White tail in the Danish Tumbler is due to a recessive factor called s_2. A cross between Petenten and Tumbler gave all black tails in F_1. Spotting depends on 1 or more factors or factor series in pigeons. Linkage relations indicate that the same factor may produce spots in different body regions.—The following color factors are discussed and ratios obtained in crosses: *A* for dominant red color; *r* for recessive red; *d* is a recessive dilution factor; *w* is a recessive restriction factor; *g* is a recessive factor for pigment distribution and gives uniformity of color in all plumage; *S* is a dominant for pigment distribution; *C* is a factor giving the wing bows a different color from that of the body; *St* gives flecking. The *g* factor has not been previously discovered. The ratios obtained in crosses indicate that it is a recessive to the normal allelomorph. In 38 matings between heterozygous intense × dilute, 94 offspring were intense 82 dilute. The authors endeavor to explain this deviation from a 1 to 1 ratio as being due to seasonal variability.—Crosses between Danish Tumbler (long bill) and Norwegian Petenten (short bill) showed that long bill is an incomplete dominant over short bill.—Crosses between Norwegian Petenten and Danish Tumbler show smooth head condition dominent to head ruff. A recessive factor *ru* is assumed for the ruff condition.—The neck ruff character behaves as a recessive (factor *kr*) to smooth feathering.—Three shades of Iris color are considered, orange, dark brown, and white. Crosses between Petenten with brown Iris and Tumbler with white

eyes gave in F_1 both white and orange color but no brown; the tests were not carried further.—*F. A. Hays.*

3451. Dechambre, E. **La polydactylie chez le cheval. [Polydactylism in the horse.]** Rev. Zootech. [Paris] **15**: 518–522. *3 fig.* 1922.—The author describes a case of polydactyly in a colt. There was a supernumerary digit on the right fore foot, which was successfully removed. The anomaly is reported fairly often, the author having easily found 25 cases in the literature since 1853. He points out that it is not a pathological aberration of development but the recurrence of an ancestral trait.—*Sewall Wright.*

3452. Detlefsen, J. A. **Linkage of dilute color and dark-eye in mice.** [Abstract.] Anat. Rec. **26**: 396. 1923.

3453. Feldman, Horace W. **Color varieties of the black rat.** [Abstract.] Anat. Rec. **26**: 391–392. 1923.

3454. Feldman, Horace W. **Linkage relations of albino allelomorphs in rats and mice.** [Abstract.] Anat. Rec. **26**: 391. 1923.

3455. Garber, R. J., and K. S. Quesenberry. **Natural crossing in winter wheat.** Jour. Amer. Soc. Agron. **15**: 508–512. 1923.—In 1,461 field-selected head rows of 19 winter-wheat varieties, 59 were found to be segregating; 36 spikes taken from the 59 rows were found to be of the F_1 generation. It was calculated that natural crossing amounted to less than 0.5%.—*L. R. Waldron.*

3456. Georgevitch, J. **Sur les phénomènes de sexualité chez Myxobolus pfeifferi. [Sexual phenomena in Myxobolus pfeifferi.]** Compt. Rend. Soc. Biol. **89**: 115–118. 1923.—The life cycle with especial reference to the reproductive phenomena is given for *Myxobolus pfeifferi*, a myxosporidian parasite on perch.—*Oran Raber.*

3457. Gilman, Herbert L. **A study of some factors influencing fertility and sterility in the bull.** *61 p., 12 pl.* J. B. Lyon Co.: Albany, 1923.—A review of the present state of knowledge in regard to the anatomy, physiology, pathology and bacteriology of the reproductive organs of the bull and a description of the conditions observed in the genital tract of a large number of infertile bulls in comparison with a number of fertile ones. A great variety of factors appeared to be involved in these cases.—*Sewall Wright.*

3458. Goldschmidt, Richard. **Kleine Beobachtungen und Ideen zur Zellenlehre IV. Die Sammelchromosomen der Schmetterlinge. [Observations and suggestions contributing to cell-knowledge IV. The compound chromosomes of the Lepidoptera.]** Arch. Zellf. **17**: 167–184. *Fig. 1-33.* 1923.—Spermatocytes of *Lymantria dispar*, the gypsy moth, show in metaphase of the 1st maturation division 31 pairs of chromosomes. At stages slightly previous to this, however, there are seen instead 10 "compound chromosomes" (Sammelchromosomen), of which 6 are larger than the rest. Each of these is composed of several chromosome pairs, which are strung together in a chain in such a way as to form a double row of single chromosomes. The origin of these structures from the network of the growth period is described, the 31 bivalent chromosomes being early represented by as many net-knots. The compound chromosomes break up into the individual chromosome pairs just previous to the 1st maturation metaphase. A number of other Lepidoptera were examined for compound chromosomes, with mostly negative results. *Lymantria monacha* showed them to a less striking degree, and conditions in *Callosomia promethea* and *Saturnia Pyri* suggested the formation of such structures. Corresponding stages in the development of the egg were not worked out by the author. The mechanism here described would make possible many types of segregation. At the formation of the compound chromosomes, either the chromosomes must line up so that all descended from 1 parent are in 1 line, and all from the other in the other line; or else they need not follow this rule strictly. Under the 1st alternative, 3 possibilities may result in the 1st maturation division. Suppose the arrangement of the single chromosomes in a compound one to be $\frac{ABCD}{abcd}$. At the formation of the equatorial plate and the separation of the bivalent chromosomes from one another, the position of the individual chromosomes may conform to this arrangement, so that *ABCD* will go to one pole, and *abcd* to the other. Or, the chromosome pairs, after separation, may become placed with reference to the poles according to chance, in which case Mendelian segregation will be the

result. Or, the individual chromosomes may retain, as a rule, their original positions, but 1 pair may act differently and become placed according to chance. This would result in the phenomenon of crossing over. Under the 2nd alternative, chance may determine whether a given individual chromosome will be placed in one row or the other. Thus, a compound chromosome might have the formula $\frac{AbCD}{aBcd}$. This would result in Mendelian segregation. Or, chromosomes descended from the same parent may, as a rule, be placed in the same row, this rule occasionally being broken in which case crossing over will again be the result.—*Ralph E. Cleland.*

3459. Graves, E. W. **Is Botrychium dissectum a mutant?** Amer. Fern Jour. **13**: 87–89. 1923.—The author discusses the question of the probable relation of *Botrychium dissectum* to *B. obliquum* and concludes that the arguments which have been advanced for considering *B. dissectum* a sterile mutant of *B. obliquum* on the bases (a) that they always occur together, and (b) that *B. dissectum* is always less common in such associations, are contradicted in their occurrence in Georgia and Alabama where for hundreds of plants of *B. obliquum* the writer has not found a single plant of *B. dissectum*. He suggests that their association elsewhere is more likely to be due to similar environmental requirements of soils, etc., rather than to the frequent occurrence of the same mutation. He points out as relevant that *Asplenium pinnatifidum* sometimes approaches *A. Bradleyi* in leaf division, and frequently grows associated with the latter species, but is otherwise distinguishable.—*R. C. Benedict.*

3460. Griffee, Fred. **Factor relations in barley species crosses.** [Abstract.] Anat. Rec. **26**: 384. 1923.

3461. Hanson, Frank B. **The effects of administration of alcohol fumes to five successive generations of albino rats.** [Abstract.] Anat. Rec. **26**: 392. 1923.

3462. Harland, Sydney Cross. **The inheritance of the number of boll loculi in cotton.** Jour. Textile Inst. **14**: T482–488. 1923.—Crosses were made among several varieties (Sea Island, Upland, etc.) characterized by mean numbers of loculi of from 3.0 to 4.2. F_1 in no case showed complete dominance and F_2 distributions indicated a multifactorial character. In some cases, parental ranges were transgressed in F_2. Variation in F_3 was nearly always less than in F_2, and some F_3 progenies showed very little segregation. The author concludes that "meristic characters are inherited, and there is strong evidence that the results are capable of being interpreted on a factorial basis;" also that "new forms can be synthesized out (intermediate values) or analyzed out (higher or lower values)."—*T. H. Kearney.*

3463. Harrington, J. B. **The inheritance of rust resistance in a cross between two Durum wheats.** [Abstract.] Anat. Rec. **26**: 383. 1923.

3464. Heppner, M. J. **The factor for bitterness in the sweet almond.** Genetics **8**: 390–391. 1923.—In an almond crossing experiment of 243 trees that came into bearing in 1922, there were 184 with sweet almonds and 59 with bitter almonds. This gives a ratio of 3.028: 0.972. This approximation of the Mendelian 3:1 ratio indicates that the varieties used in the crosses were heterozygous for sweetness. Since many horticulturists claim that the original almond was bitter, the sweet almond is possibly a mutation. This is of interest because the mutant character is dominant and consists of the loss of the bitter principle in the wild progenitor.—*Iva A. Merchant.*

3465. Heuser, W. **Beobachtungen über Farbvariationen der Samenschale von Vicia Faba.** [**Observations on color variation in seed coats of Vicia Faba.**] Zeitschr. Pflanzenzücht. **9**: 178–184. 1923.—Detailed data show that varieties of this species planted adjacently commonly produce hybrid offspring. Evidently violet and black dominate over "normal" color. In 1 case apparently a bud variation occurred, as both violet and normal colored seed were found in 1 pod, both breeding true.—*L. R. Waldron.*

3466. Hirmer, Max. [Rev. of: Winkler, Hans. **Verbreitung und Ursache der Parthenogenesis im Pflanzen- und Thierreiche.** (**Distribution and cause of parthenogenesis in the plant and animal kingdoms.**) *vi* + *231*. Gustav Fisher: Jena, 1920.] Biol. Centralbl, **41**: 142–144. 1921. [See also Bot. Absts. 11, Entries 245, 3860.]

3467. I., J. O. [Rev. of: Narumi, S. **Some formulas in the theory of interpolation of many independent variables.** Tôhoku Math. Jour. **18**: 309–321.] Biometrika **14**: 420. 1923.

3468. Ibsen, H. L. **Evidence of the independent inheritance of six pairs of allelomorphs in guinea-pigs.** [Abstract.] Anat. Rec. 26: 392–393. 1923.

3469. Issajew, W. **Vererbungsstudien an tierischen Chimaeren.** [Genetic studies on animal chimeras.] Biol. Centralbl. 43: 115–123. 1923.—The author made grafts of *Pelmatohydra oligactis* and *Hydra vulgaris* and obtained 3 kinds of chimeras: (1) longitudinal sections of both species present, each involving inner and outer "components" of the organism; (2) inner component from one species, outer from the other; (3) irregular mixtures—piebald. Sectorial chimeras were obtained by grafting, and from them sectorial chimera buds developed by budding, but the author was unable to rear the latter. In all "Ganzorganismenchimären" the red vulgaris parts gradually disappear and the individual looks like *P. oligactis*. Such animals, however, give 2 kinds of buds; 1 is *P. oligactis* and reproduces like pure *P. oligactis* (vegetatively); the other is "oligactoid," having tentacles like *H. vulgaris*, but being mainly like *P. oligactis*. By budding it gives both types, like parent. These are again pure breeding *P. oligactis* and "oligactoids" which give both types. This continued for all 6 generations studied. The behavior is explained on the assumption that while all visible parts of a chimera become *P. oligactis* the interstitial cells of *H. vulgaris* remain and mix with those of *P. oligactis* and the buds are derived from these. No pure *H. vulgaris* buds were obtained. "Oligactoids" are less viable and reproduce more slowly than *P. oligactis*. The per cent of *P. oligactis* from "oligactoids" decreased in successive vegetative generations.—*C. W. Metz.*

3470. Janchen, Erwin. **Das Verhalten der Geschlechtsfaktoren bei der Embryosackbildung der Blütenpflanzen.** [The deportment of the sex factors in embryo-sac formation in flowering plants.] Zeitschr. Indukt. Abstamm.- u. Vererb. 31: 261–267. 1923.—According to the present understanding of sex in plants each haploid individual contains both kinds of sex determiners (anlagen) even though these are of different strengths, corresponding thus to the formulae *F M*, *fM* or *Fm*, in which neither *f* nor *m* represents a loss but only a lessened strength of the ♀ or ♂ determiner. The formula of a normal hermaphrodite is then *FF MM* where *F* and *M* represent equal valences. In pure dioecious species the ♂ is usually considered heterozygous and may be represented by the formula *Ff MM;* and the ♀, homozygous and represented by *FF MM*, the *F* prevailing over the *M* (*F*>*M*). Hermaphrodites produced by hybridization have been demonstrated to be heterozygous. The Hertwig sisters have considered the egg cells in these individuals would be of 2 kinds, as would be expected. The author points out the difference in the number of gametes produced from pollen mother cells and from megaspore mother cells and states that whereas pollen should always be in 1:1 ratio in heterozygous individuals the ratio in the egg cells will depend upon chance and will be approximately equal only when the developmental conditions for both kinds of embryo sacs are equally good. He considers that those cells of the tetrad containing the strongest valence for femaleness (or maleness) are most likely to be favored in the struggle for existence of the 4 cells of the tetrad, and that these types alone will prevail to the nearly complete exclusion of the other type. A heterozygous individual may therefore usually be considered homogametic as far as the ♀ gametes are concerned. This hypothesis is then applied to sex-inheritance studies of others where irregular sex ratios have been obtained and is considered to explain the results better than the more generally accepted hypothesis. The author concludes that sex in plants concerns characters which are bound up with the entire organism, and which have nothing to do with Mendelism.—*W. D. Valleau.*

3471. Johanssen, O. A. **Eye structure in the "spineless-glass" mutant of Drosophila.** [Abstract.] Anat. Rec. 26: 396. 1923.

3472. Jones, D. F. **Selective fertilization shown by different gametes from the same individuals.** [Abstract.] Anat. Rec. 26: 385. 1923.

3473. Jull, M. A. **The mechanism of heredity.** Sci. Agric. 3: 163–168. 1923.—This popular general discussion of the current facts and hypotheses of the mechanism of heredity and embryonic differentiation as presented by Morgan and Conklin, deals with germplasm, chromosomes, fertilization, sex determination, linkage, limitation of linkage groups, and the relation of cytoplasm to heredity.—*J. Ben Hill.*

3474. Junker, Hermann. **Cytologische Untersuchungen an den Geschlechtsorganen der halbzwitterligen Steinfliege Perla marginata (Panzer). [Cytological investigations upon the sex organs of the semi-hermaphroditic stone-fly, Perla marginata.]** Arch. Zellf. 17: 185–259. *Pl. 9–12. fig.1–11.* 1923.—The ♂ of this species possesses, in addition to functional testes, a well developed ovary, which however, does not produce functional eggs. A comparative study of maturation phenomena in testes, ovary and ♂ ovary is particularly interesting in view of the fact that the number of chromosomes in ♂ and ♀ is different. The diploid number of chromosomes in spermatogenesis is 22, 10 pairs of autosomes, and 2 unequal heterochromosomes. The spermatogonial nucleoli possess 2 particles, unequal in size, which are considered to be the heterochromosomes, persisting through the resting stage. These fail to pair when the autosomes conjugate, but later during the growth period they come together. The 1st maturation division is the reduction division, both of the heterochromosomes going undivided to 1 pole. Half of the sperm, therefore, have 10 chromosomes, and half 12 chromosomes. The development of normal and giant spermatozoa is described. The diploid chromosome number in oogenesis in the ♀ is 24. All of the chromosomes are paired. The process of oogenesis presents no unusual features. In the cells of a ♂ ovary the diploid number of chromosomes is 22, made up of 10 pairs of autosomes and 2 unequal heterochromosomes. In spite of the ♂ number of chromosomes, the development is that of the true oogonia and oocytes, up to the time of the conjugation of the leptonème threads. The heterochromosomes do not come together until long after the conjugation of the autosomes. The cells begin to degenerate toward the end of the growth period. They do not approach the normal ♀ eggs in size. In 1 case, a normal testicular follicle was found in a ♂ ovary. Occasional eggs were also found developing in otherwise normal testes. These degenerated usually in or just after the pachytène stage. Their chromosome number was 22. The differentiation of germ cells into eggs or sperm is not considered by the author to be directly due to the influence of the heterochromosome apparatus, This apparatus influences in a direct way only the sexual characteristics of the soma. The soma acts directly upon the developing sexual organs, causing them to develop into testis or ovary, and the gonads in turn exercise an influence upon the at first sexually indifferent germs cells within, causing them to become sperm or egg. The bearing of these studies upon the inter-sex theory of Goldschmidt is discussed.—*Ralph E. Cleland.*

3475. Kammerer, Paul. **Experiments on Ciona and Alytes.** Nature 112: 826–827. 1923. [See also Bot. Absts. 13, Entries 1547, 1577, 1582, 1592.]

3476. Kammerer, Paul. **Inheriting acquired characteristics.** New Republic 35: 226–227. 1923.—(1) *Salamandra maculata*, normally oviparous, when kept dry, retains offspring progressively longer in utero at successive pregnancies until at 4th pregnancy it becomes fully viviparous like *Salamandra atra*, retaining offspring till gills have disappeared and all but 2 offspring have devoured each other. These offspring also are viviparous. (2) Extension of the yellow color in the variety of *S. maculata* having spots (on black) is also affected by environment, young kept on black background becoming nearly black, those on yellow acquiring large yellow spots that run together into bands. Offspring of either of latter artificially induced varieties are again modifiable by environment in either direction, but the offspring of artificially black salamanders can be made to become blacker than those of artificially yellow banded. (3) The author reports that artificially yellow banded when crossed by non-banded (direction of cross not stated) gives intermediates. (4) There is also a variety of *S. maculosa* naturally having yellow bands and this acts as a simple Mendelian recessive to spotted variety, giving 3 spotted: 1 banded in F_2. The author concludes that "old characetristics" (as in natural banded race) unlike newly acquired characteristics" (as in artificialy banded) can no longer exercise an influence on the germ plasm (of the hybrid). (5) When siphons of ascidian *Ciona intestinalis* are amputated they regenerate siphons longer than before, and by successive amputations siphons are caused to become very long. Offspring inherit the long siphons. (6) When posterior portion of artifically long-siphoned Ciona, including gonad, is cut off, gonad is regenerated from the soma, and offspring from the new gonad still inherit the acquired character. The author believes this a crucial experiment, concluding that "the body is a necessary link between parent and offspring in the inheritance of the new," and maintains that this applies to organisms in general. [See also Bot. Absts. 13, Entries 1560, 1576.]—*H. J. Muller.*

3477. Kappert, H. **Ist das Alter der zu Kreuzungen verwandten Individuen auf die Ausprägung der elterlichen Merkmale bei den Nachkommen von Einfluss? [Does the age of parents influence the expression of parental characters in progency?]** Biol. Zentralbl. **42:** 223–231. 1922.—Zederbaur had claimed that inheritance of yellow vs. green seed in peas was influenced by age of blossoms used in crossing. If early flowers of yellow peas were pollinated with pollen from late flowers of green peas, the F_1 were all yellow, and vice versa. The F_2 also is mainly of the F_1 type. Kappert repeated these experiments, but secured no corroborative evidence, although the ratios were variable. The author thinks Zederbaur got accidental pollination and not actual crosses. Potentially green seed are often yellowish if unhealthy, which may help to account for the discrepancy.—*C. W. Metz.*

3478. Kelly, James P. **Seed progency of a potato with faintly colored tubers.** [Abstract.] Anat. Rec. **26:** 387. 1923.

3479. Kelly, James P. **Variable dominance of the single flower in Phlox Drummondii.** [Abstract.] Anat. Rec. **26:** 386–387. 1923.

3480. Kendall, M. L. **A study of variation in Polypodium californicum Kaulf.** Amer. Fern Jour. **13:** 75–87. *3 pl.* 1923.—The author presents a detailed study of variant types of 2 forms of *Polypodium* commonly recognized as distinct varieties under the names *P. californicum intermedium* and *P. c. Kaulfussii*. Fluctuation curves are presented of the outline of the leaf blade; ratio of length to breadth of blade; form of blade apices; margins; pinnae; texture and venation; number of sori per pinna; rhizome scales; etc., covering examinations of hundreds of leaves with conclusions as follows: (1) *P. c. Kaulfussii* is an extremely variable fern, the variations in each character studied surpassing those given in published descriptions; (2) a careful study shows a close approach to *P. vulgare;* (3) there are 2 quite distinct groups: the var. *Kaulfussii* D. C. Eaton and var. *intermedium* (Hook & Arn.) D. C. Eaton, the former occurring only in a narrow strip along the coast and the latter to some extent along the coast but more commonly inland. In general, these 2 forms exhibit the same variations and vary within the same limits, so that they can certainly not differ in more than varietal degree. The only distinctive features observed were: (1) a leathery texture for *Kaulfussii*, approached by *intermedium* only when growing in very exposed places; (2) a tendency to more definitely closed areoles in the former, although this tendency is frequently met in the latter.—*R. C. Benedict.*

3481. King, H. D. **A new occurrence of the black-eyed yellow mutation in rats.** Science **58:** 250–251. 1923.—In the 25th generation of a large inbred strain of black rats appeared a "cream" individual that was proved by crosses to be the non-agouti form of black-eyed yellow. As various matings involving the parents of the 1st animal gave creams, it is concluded that a mutation occurred in the germ cells of a rat 2 or 3 generations earlier.—*E. C. MacDowell.*

3482. Koehler. [German rev. of: Haecker, Valentin. **Allgemeine Vererbungslehre. (General genetics.).** *3rd ed., 444 p., 149 fig.* Vieweg & Sohn: Braunschweig, 1921 (see Bot. Absts. 10, Entry 92).] Biol. Centralbl. **41:** 575–576. 1921.

3483. Kopeć, S. **O potomstwie dwóch ojców w jednym miocie u królic. [On the offspring of two sires in one litter of rabbits.]** Mem. Inst. Nation. Polonais Econ. Rurale a Pulawy **2:** 214–235. *1 fig.* 1923. [Summary in English p. 229–232.]—The same material is found in Jour. Genetics **13:** 371–382. 1923 [see following abstract].—*Sewall Wright.*

3484. Kopeć, Stefan. **On the offspring of rabbit-does mated with two sires simultaneously.** Jour. Genetics **13:** 371–382. *1 fig.* 1923.—Twenty-four ♀ Himalayan rabbits were mated at different times with a Himalayan and a Silver ♂. The crossbred young differed in color and were about 20% heavier at birth, the Silver being a heavier breed than the Himalayan. The same females were then double mated with the males of the 2 breeds. In 3 cases, purebred and crossbred young, identified by their colors, were born in the same litters. The crossbreds were over 20% heavier than the purebreds on the average, in reasonable agreement with the results in separate litters. Both purebreds and crossbreds, however, were somewhat heavier than the young of the same breeding in separate litters (7 and 11% respectively), a result which the author interprets as indicating that the fetuses of the 2 kinds have an influence on each other. The possibility of a real foundation for telegony is suggested.—*Sewall Wright.*

3485. Kottur, G. L. **Studies in inheritance in cotton. I. History of a cross between Gossypium herbaceum and Gossypium neglectum.** Mem. Dept. Agric. India Bot. Ser. **12:** 71–133. *Pl. 1.* 1923.—The author discusses the importance of combining by hybridization the best characters of 2 or more of the species of cotton grown in India and the reasons for failure of most previous similar efforts. He reviews briefly the findings of the other investigators in India and of Balls in Egypt on inheritance of characters in cotton. The remainder of the paper gives data on hybrids secured by the author between a selected strain of *Gossypium herbaceum* and *G. neglectum* var. *rosea*. The parents differed in the following important characters, of which inheritance in the hybrid was studied: presence or absence of red color in "stalk of cotyledons," shape of leaf (as expression of which the author prefers length and breadth of central lobe, determined separately, to "leaf factor" used by Leake), color of petals, length of petals, presence or absence of extra-floral nectaries, color of fiber, length of fiber, lint percentage. Red color in cotyledonary stalks is partly dominant, segregation in F_2 indeterminate. The leaves of the F_1 resembled *G. neglectum* in length and *G. herbaceum* in breadth of middle lobe, long and broad being dominant, while the behavior in F_2 indicated an independent 3:1 segregation for each dimension and data from numerous F_3 and F_4 progenies are regarded as confirmatory. The *G. herbaceum* parent has yellow and the *G. neglectum* parent white petals. The F_1 was intermediate (pale yellow) and the F_2 showed segregation into full yellow, pale yellow and white, in no recognizable Mendelian ratio but with a great preponderance of pale yellow. In F_3 the white bred true as did a few of the full yellows, while others of this class and all but 1 of the 17 progenies from the pale yellow F_2's segregated variously. A similar behavior was recorded in F_4. Long petal showed a marked tendency to dominance over short; but in F_2 the ratio of long to short petals was 1:2.8, and this result was only partly accounted for by the high correlation found between shortness and white color of petals. Presence of extra-floral nectaries was dominant, and the ratio in F_2 was 2.4:1. High lint percentage of *G. neglectum* parent appeared to be dominant in F_1 and the evidence from F_2 and later generations is regarded as showing this character to depend upon a single factor. Long fiber was nearly dominant over short fiber and the author considers that, making allowance for linkage believed to exist between fiber length and fiber color, approximate 3:1 ratio in favor of long fiber can be shown to obtain in F_2. Evidence is given to show that the generally assumed negative correlation between long fiber (high lint percentage) is non-existent and that the 2 characters are independent.—*T. H. Kearney.*

3486. Lefevre, George, and E. H. Rucker. **The inheritance of spangling in poultry.** Genetics **8:** 367–389. *35 fig.* 1923.—Reciprocal crosses between spangled Hamburgs and Brown Leghorns show that the spangled pattern depends upon a dominant sex-linked factor Z^s. This factor behaves in the normal manner for sex-linked factors in poultry, namely, $Z^s Z^s$ in ♂ and $Z^s W$ in ♀. The expression of spangling was modified and sometimes obscured by other factors. There was a variation in the amount of spangling and a few self-colored birds appeared. These minor modifiers were not identified in the experiment reported.—*F. A. Hays.*

3487. Lehmann, E. **Kreuzungsversuche zwischen verschiedenen Epilobium-Arten. [Hybridization experiments between various species of Epilobium.]** Jahresh. Ver. Vaterländ. Naturk. Württemberg **78:** xlviii. 1922.—Wide differences were found in reciprocal crosses between the same species of *Epilobium*. Fertile hybrids from such crossing after selfing gave extremely diverse types of progeny, part of which died before reaching the flowering stage, and part of which formed seed.—*Orland E. White.*

3488. Lenz, F. **Die Akromelanie der Russenkaninchen und ihre Bedeutung für unsere Auffassung von der Akromegalie. [The akromelany of Russian rabbits and its significance in an understanding of akromegaly.]** Arch. Rass.- u. Ges. Biol. **15:** 24–33. *3 fig.* 1923.—The author confirms earlier experiments by himself and by W. Schultz which indicate that the black points (nose, ears and feet) of Himalayan rabbits are due to the relatively low temperatures of the skin of these parts of the body. By removing the hair from other parts of the body he could induce black pigmentation. The critical temperature of the skin appears to be about 25°C. The induced modifications were not transmitted to the progeny. The simi-

larity in the location of the most pronounced overgrowth in akromegaly with the black points in akromelany is noted. It is suggested that the pituitary hormone believed to be involved in the former may react to cold similarly to the thermolabile factor in pigmentation, and that it may be an important function of the pituitary to regulate growth of the extremities by counterbalancing the prevailing tendency toward more rapid growth at higher temperatures. —*Sewall Wright.*

3489. Lindstrom, E. W. **Tricomplementary genes for albino maize seedlings.** [Abstract.] Anat. Rec. **26**: 385. 1923.

3490. MacDowell, E. C. **Alcoholism and the growth of white rats.** Genetics **7**: 427–445. *3 fig.* 1922.—Treatment of white rats with fumes of alcohol from weaning to maturity reduces their growth as compared with that of their untreated brothers and sisters. The treated ♂ offspring of treated rats show no significant difference from their controls. The untreated ♂ offspring of treated rats are heavier than their controls. A 2nd generation (treated grandparents) also show a slightly greater weight than their controls. The results from the ♀ tend to support those from the ♂ although less reliable because of pregnancies. "These results may be interpreted by supposing that the alcohol treatment has two opposing tendencies, namely (1) a tendency to retard the normal rate of growth and, (2) a tendency to prevent the reproduction of those females bearing weaker-growth genes and so to raise the weight average in the next generation."—*Sewall Wright.*

3491. MacDowell, E. C. **Experiments with alcohol and white rats.** Amer. Nat. **56**: 289–311. 1922.—In these experiments a control and a test lot were selected from litter mates produced by brother-sister matings. Four groups of test animals were used: treated from normal parents, treated from tested parents, untreated from treated parents, and untreated from untreated parents but treated grandparents. Treatment consisted of daily anaesthetization with alcohol. Each test group was compared with the corresponding generation of controls. All 4 test groups took slightly more time in running a maze and all produced smaller litters (10–13%) than their controls. These results are interpreted as suggesting germinal modification. As compared with their controls the test rats produced a much smaller number of litters(65%) and grew more slowly (about 16%).—Their treated offspring again produced fewer litters and grew more slowly than their controls but the differences were distinctly less extreme than in the 1st generation (about 35% fewer litters, 5% lighter weight). The untreated offspring of tested parents on the other hand produced more litters (33%) and grew more rapidly than their controls (7%). The 2nd untreated generation produced a still greater excess of litters (55%) and continued to show more rapid growth than their controls (12%). These results with respect to frequency of litters and weight are interpreted as indicating a direct injurious effect of alcohol accompanied by a beneficial selective action. The evidence for this type of effect is considered stronger than that for germinal modification from the data on maze running and size of litter.—*Sewall Wright.*

3492. MacDowell, E. C. **The corpora lutea of pregnancy in living mice as a measure of prenatal mortality and fecundity.** [Abstract.] Anat. Rec. **26**: 395. 1923.

3493. Metz, C. W. **The parallel characters yellow and scute in Drosophila virilis.** [Abstract.] Anat. Rec. **26**: 397. 1923.

3494. Morgan, T. H. **Heredity of embryonic characters.** Sci. Monthly **18**: 5–17. 1924.—The principles of Mendelian inheritance can be illustrated by character differences drawn from embryos and larvae. Thus the colors and patterns of caterpillars of the silkworm, and differences in the color of their blood correlated with differences in the colors of the cocoons, illustrate dihybrid ratios, multiple allelomorphs, linkage, and the absence of crossing-over in the ♀. Caterpillars of 2 other genera have also been shown to have Mendelian inheritance of character differences. In the silkworm, sex-linked inheritance has been demonstrated with regard to the translucent or opaque skin; and has also been shown to exist in the larvae of species crosses of moths of the genus *Pygaera*. In *Drosophila* there is a sex-linked larval tumor, which is lethal. Maternal "inheritance" is due to a property of the unfertilized egg which the sperm has not had time to change. It is illustrated by the maternal rate of cleavage in the crossed eggs of sea-urchins and fish, and in part by the color of eggs of silkworms. Also in silkworms, the appearance of a 2nd brood in the year (i.e., the production of non-hiber-

nating eggs) is usually a function of the maternal race. Lastly, in dextral and sinistral snails the character of the cleavage of the egg, and hence the direction of the coils of the shell, is not determined by the sperm; for, though the inheritance is Mendelian, the appearance of the character is delayed for a generation.—*John Belling.*

3495. Muller, H. J. **Recurrent mutations of normal genes of Drosophila not caused by crossing over.** [Abstract.] Anat. Rec. **26**: 397–398. 1923.

3496. Munerati, O. **Beitrag zum Studium der Selbstunempfänglichkeit des Roggens (Secale cereale L.).** [Contribution to a study of self-sterility of rye.] Zeitschr. Pflanzenzücht. **9**: 176–178. *1 fig.* 1923.—Three winter rye plants, after stooling, were vegetatively propagated and so planted as to effect the 3 possible inter-plant cross pollinations. When pollinated inter-clonally, fertility was very low, about 1 grain per spike; but pollination between the 2 groups now known to be related resulted in normal or nearly normal fertility.—*L. R. Waldron.*

3497. Namikawa, Isawo. **Growth of pollen tubes in self-pollinated apple flowers.** Bot. Gaz. **76**: 302–310. *Illus.* 1923.—The writer describes the growth of pollen tubes in self-pollinated and exposed flowers of the Yellow Bellflower at different stages up to 72 hours. He finds that the rate of growth of the pollen tubes in the selfed flowers was not appreciably delayed, neither did they show any abnormal features in development. Normally the pollen tube grows down the outside of the style in a stigmatic excretion; when the pollen tube behaves abnormally it grows down into the tissue of the style and the growth is slow and the tips sometimes swollen. He suspects that Ostewalder's report of the abnormal behavior in the development of pollen tubes in selfed flowers was based on observations of this abnormal development.—*Iva A. Merchant.*

3498. Painter, Theophilus S. **Further observations on the sex chromosomes of mammals.** Science **58**: 247–248. 1923.—The chromatin nucleolus in opossum was followed from its first appearance through the 1st maturation division. It forms the X-Y chromosomes. During the growth period it is very labile exhibiting a variety of forms. "Unlike the insects, the X and Y elements of mammals are very intimately associated during the whole growth period." Sex chromosomes of the ♂ Old World monkey, *Rhesus maccacus* was found to be of the XY type, as in man and a New World monkey previously studied. The ♀ is XX and both sexes have 48 chromosomes.—*C. W. Metz.*

3499. Park, J. B. **Inheritance of lemma appendages in cultivated barley.** [Abstract.] Anat. Rec. **26**: 384–385. 1923.

3500. Parnell, F. R., G. N. Rangaswami Ayyangar, K. Ramiah, and C. R. Srinivasa Ayyangar. **The inheritance of characters in rice, II.** Mem. Dept. Agric. India Bot. Ser. **11**: 185–208. *5 pl.* 1922.—Four factors affecting glume color are worked out in detail. In their absence the glumes are light gold. The constitution of the following types is demonstrated: *G G* dark gold, and *G g* intermediate; *G G P* piebald gold; *G G T* tipped gold; *G g T* patchy gold; and *g g T* ripening straw. A factor *I* replaces gold with a blackish brown color, dark furrows, of depth and distribution corresponding to the gold types. All *i i* types have golden internodes; with *I* present they are green. *G*, *I*, and *T*, also *I* and *P*, are independent.—Coarseness of grain is associated with *G*; *G G* types are coarse and heavy; *G g* intermediate; *g g* fine and light.—A dwarf character is described in which all parts of the plant, including the grain, are markedly shortened. Dwarf is entirely recessive to normal and in F_2 there is clear-cut segregation giving a 3:1 ratio, indicating a single factor difference.—Two factors *A* and *N* are necessary for the production of anthocyan pigmentation in any part of the plant. A factor, *R*, gives red rice with *A* present and gray brown in *a a* types. A factor, *P*, gives purple rice with *A* present, and brown in *a a* types. The factors *A*, *N*, *P*, and *R* are independent. *R* gives red rice with *I* present, but in *i i* types, with golden glumes, it gives golden rice. *R* and *I* are independent. *R i* types with golden rice give shriveled grain, whereas *R I*, *r I*, and *r i* types in the same family give well filled grain. No explanation of this result is offered. *I* is not necessary for the production of purple rice by *P*.—*F. R. Parnell.*

3501. Payne, F. **Balanced lethals and cross-over modifiers in the third chromosome of Drosophila melanogaster.** [Abstract.] Anat. Rec. **26**: 397. 1923.

3502. Pearson, E. S. **The probable error of a class-index correlation.** Biometrika **14**: 261–280. 1923—A class index correlation is a correlation between the quantitative value of a variate and its class index when the variate is classed in broad categories. It must be used as a correction in determining correlation from data classed in broad categories, whether by contingency or correlation ratio methods. The formulae for the probable error are worked out in the paper. It is concluded in general that "a class index correlation based on broad categories is not subject to a large probable error, but only to an error of the same, or even a less, order than a product moment coefficient of correlation."—*Sewall Wright.*

3503. Pearson, Karl. **Further note on the χ^2 test of goodness of fit.** Biometrika **14**: 418. 1923.—In pseudo-fourfold table cited from Greenwood and Yule, marginal totals are fixed; therefore $n' = 2$ instead of 4.—*J. R. Miner.*

3504. Pearson, Karl. **On the χ^2 test of goodness of fit.** Biometrika **14**: 186–191. 1922.—A reply to R. A. Fisher's criticism that in testing goodness of fit of a frequency distribution to a frequency curve, n' should be reduced by the number of moments used in fitting the curve. The moments of the sample are used as the only available approximations to those of the sampled population; there is, therefore, no limitation in degrees of freedom of sampling. For a fourfold table $n' = 4$.—*J. R. Miner.*

3505. Philiptschenko, Jur. **Studien über Variabilität. 3. Über die Variabilität der Collembolen.** [**Studies on variability. 3. On variability in Collembola.**] Zeitschr. Indukt. Abstamm.- u. Vererb. **30**: 146–162. 1923.—Alcoholic material of many species was studied and measurements of a large number of characters were made by micrometer ocular. From these measurements indices were derived. Indices characterized by large letters are regarded as generic, by small letters as specific. Extreme limits of distribution were also recorded. For each species there was determined the mean coefficient of variability ($\Sigma C/N \pm \sqrt{\Sigma m_c^2/N}$) of specific characters and that of generic characters, the difference between these, and the standard error of this difference ($m_{Dif.} = \pm \sqrt{m_1^2 + m_2^2}$). This shows the specific character variation to be greater than the generic. For *Tornocerus* this difference is $5\frac{1}{2}$ times and for *Isotoma* 8–10 times its standard error. For *Smithurus fuscus* and *Dicyrtoma atra* it is 4–$4\frac{1}{2}$ times. Hence the greater a group taxonomically for which a certain size relation is characteristic, the less is its variability, and the smaller a group characterized by a certain index, the greater its variability. What is the relation between variability in a geographically localized and widely distributed species? Comparison of *Tornocerus vulgaris* and of *Isotoma viridis* from Peterhof and elsewhere shows no significant difference, nor does the comparison of the cosmopolitan *Hypogastrura viatica* and the localized *H. schuppli* and of the widely distributed *Onychiurus armatus* and the localized *O. alborufescens*. Hence wide distribution fails to show increased variability. Does membership in a large genus increase variability? The difference in variability of specific and of generic characters is 9–10 times its standard error for the large genus *Onychiurus*, 14 times for the large genus *Hypogastruro*, 14 times for the monotypic genus *Podura* (*aquatica*) and 11 times for the monotypic genus *Tetradontophora* (*gigas*). Hence membership in a large genus fails to increase variability. This last rule applies to grading differences, not to richness in distinct varieties. Older systems of classification, Lubbock (1873), Tullberg (1872), and Shäffer (1896), founded chief groups and relatively few species on clear cut characters. With increase in the number of species and elaboration of group by Börner, Linnaniemi, etc., minor characteristics were employed, such as antennal organ III, abdominal bothriotrichs, trochanteral organ, etc. But these characters are very unreliable as the history of changes of *Isotoma palustris* by Börner himself shows. The author contends that such measurements as he has made are much more accurate for determining species, e.g., of *Isotoma*, than the slight characters appearing in the tables. It is these proportions that give distinctive habitus and the system founded on these is much more natural than one founded upon slight characters of dubious biological significance.—*P. W. Whiting.*

3506. Przibram, Hans, and W. Bateson. **Experiments on Alytes and Ciona.** Nature **112**: 899. 1923.—A letter from Przibram to Bateson and the latter's reply are printed.—*O. A. Stevens.*

3507. Rawes, A. N. **Comparative cropping of apple trees propagated from parent trees of good history and bad history.** Jour. Roy. Hort. Soc. **47**: 163–168. *3 fig.* 1922.—One consistently good cropping and 1 consistently poor cropping apple tree were selected from 4 varieties. Buds or scions from each tree were worked on both Crab and Dwarfing stocks. Uniform nursery trees were later selected and set in an orchard so that those of "good history" alternated with those of "bad history." The trees of "Good and bad History" commenced to bear fruit at about the same time and as wide variations, in number of fruits produced by each tree, were found in one group as in the other.—*Richard Wellington.*

3508. Reid, G. Archdall. **Selection and segregation.** Nature. **111**: 806–808. 1923.—This article is a reply to Willey [see Bot. Absts. 13, Entry 906.]—*O. A. Stevens.*

3509. Reynolds, Bruce D. **Inheritance of double characteristics in Arcella polypora Penard.** Genetics **8**: 477–493. *7 fig.* 1923.—An abnormal individual suddenly appeared in a "pure" line culture of *Arcella polypora* which had been kept under observation for 6 months, during which only normal organisms were obtained. The size, shape, and nuclear number of the aberrant specimen indicate that it was truly a double individual, produced, perhaps, by the failure of 2 cells to separate during fission. However, if such was the case it appears that separation occurred on one side of the oral aperture, while on the other the shell of each individual was absorbed and the 2 sarcodes joined at this point, so that the protoplasm formed a continuous mass from the distal end of one daughter-cell to that of the other. The animal looked somewhat like a bivalve, the 2 ends folding on each other like a U. The mouth of the shell was also unusual in that it was ellipsoidal rather than circular. Locomotion was accomplished in a half reclining position. When a new shell was formed, prior to the production of an offspring, its longer axis was at right angles to the long axis of the parent shell. It was found that the abnormal characteristic was inherited to a marked extent—in fact, no normal specimens were obtained during the first 40 generations. By growing the organisms in mass cultures and selecting from large numbers, it was possible to obtain variations both towards the normal condition and towards a greater degree of abnormality. By selecting the individual occupying the newly formed shell after each division a tendency was noted for the organisms to become more and more nearly normal; however, the process was a very slow one. Computing the volume and measuring the depth of the notch produced by the folded ends in 690 individuals revealed a high positive correlation between size and the degree of abnormality Though normal individuals have been obtained by selection, the stock on hand (5 months since the appearance of the 1st abnormal form) shows just as great a degree of abnormality as did the original progenitor. This observation is of special interest because it is apparently the 1st case in which such a monstrosity has been reported in the rhizopods, and also because it shows perhaps the highest percentage of inheritance of a double characteristic that has been reported.—*B. D. Reynolds.*

3510. Riddle, O. **A case of complete sex reversal in the adult pigeon.** [Abstract.] Anat. Rec. **26**: 394. 1923.

3511. Riddle, O. **On the cause of twinning and abnormal development in birds.** Amer. Jour. Anat. **32**: 199–252. 1923.—Data of unusual kinds are supplied concerning the origin of the eggs of 8 pairs of single-yolk pigeon twins. Twinning was not here the result of cooling of eggs in a pre-gastrulation stage, but was associated with unusual size of ova (yolks). Sex was known for 3 pairs of twins from ova of extremely large size. These were all females, and the sex of each pair formed a crucial test of the author's earlier conclusion, namely, that low metabolic level (high storage) differentiates ♂- and ♀- producing ova in the germinal stage. Stockard's view of twin and monster formation is extended to include accelerated developmental (or metabolic) rate as well as retardation, as a causative agent. Abnormalities arose most frequently in embryos treated with CO_2; increased O_2, decreased O_2 and low temperature followed in this order. During the first 12–24 hours of development a temperature of 103°F. is higher than the optimum and produces abnormalities.—*Author's abstract.*

3512. Riddle, O. **Suprarenal hypertrophy coincident with ovulation.** Amer. Jour. Physiol. **66**: 322–339. 1923.—In 4 kinds of healthy doves suprarenal weight was found to increase at each ovulation cycle and the point of greatest increase was coincident with the hours of ovulation. This increase was approximately 40%. Some diseases produce marked

suprarenal hypertrophy; these are separately tabulated. Both medulla and cortex share in hypertrophy at ovulation. The results offer definite knowledge of the conditions associated with previously observed changes in size of ova, of sex ratios, and of sexual development in the offspring of pigeons when the ♀ parent is made to reproduce rapidly and continuously throughout the year. Some elements of a new and intimate environment are thus provided for ova forced to develop under prolonged and nearly continuous suprarenal hypertrophy.—*Author's abstract.*

3513. Riddle, O., and H. E. Honeywell. **Effects of the onset of cold weather on blood sugar and ovulation rate in pigeons.** Amer. Jour. Physiol. 67: 337–345. 1924.—Recent and prolonged exposure to out-of-door air of strong cooling power results in marked lowering of the blood sugar. These same conditions also diminish the rate of ovulation and cause a high percentage of single or "unpaired" ovulations to replace normal paired ovulations. This supplies further evidence that ovulation in birds is normally associated with a capacity of the ♀ to effect a temporary increase of blood sugar above its normal, and that conditions which oppose this capacity tend to suppress ovulation. Facts discussed suggest that decrease of both blood sugar and ovulation rate is sometimes associated with decreased and sometimes with an increased basal metabolism.—*Oscar Riddle.*

3514. Riddle, O., and H. E. Honeywell. **The behavior of blood sugar values in heredity.** Amer. Nat. 57: 412–434. 1923.—The genera *Turtur* and *Streptopelia* (pigeons) were observed to have quite different amounts of sugar in the blood—respectively 188 and 149 mgm. per 100 cc. The amount of blood sugar in various grades of hybrids of these 2 genera is reported. A study of F_1 hybrids of a *Spilopelia* × *Streptopelia* cross was also made. F_1 hybrids from both crosses had blood sugar values intermediate to those of parent genera. Offspring of F_1 hybrids of *Turtur* × *Streptopelia* back-crossed to *Streptopelia* again gave sugar values intermediate to those of the F_1 and *Streptopelia*. Still other grades of back crosses apparently also show further blending or "fractionation" of this character. Blood sugar level is apparently inherited in the same way as is body size. The behavior in inheritance of a character fully comparable with the normal sugar level of the blood has hitherto not been studied. The hybrids had a sugar value different from those of either parent genus; and since this different value is maintained throughout the life cycle of the hybrid, requiring equilibrium adjustments on the part of other blood and tissue components of the hybrid in all stages of life and development, opportunity is offered to influence the development of many and various hereditary characters. Certain irregular and other little known hereditary and developmental phenomena found by Whitman and by Riddle in hybrids from wide crosses may thus result from the fact that in these hybrids parental characters are forced to undergo their entire development in blood which constitutes a new, intimate and continuously acting internal environment.—*Oscar Riddle.*

3515. Riddle, O., and H. E. Honeywell. **The normal blood sugar of pigeons and its relation to age, sex, species and certain diseases.** Amer. Jour. Physiol. 67: 317–332. 1924.—The normal concentration of reducing substances of the blood was measured on 415 birds belonging to 9 species, 2 derived races, and 3 groups of generic hybrids. Seven genera and 2 families of *Columbae* were represented. Most species and genera have different and characteristic sugar concentration; those examined range from 149 to 258 mgm. sugar per 100 cc. of blood. Certain diseases introduce variations. Males and non-ovulating females do not show consistent or unquestionable differences. Size of races and species studied bears no consistent relation to sugar level. Measurements were made covering the whole life cycle—embryo, 2 juvenile stages, adult stages, and in old age; values obtained for all ages were notably similar in any single species or race. Alimentary hyperglycemia was found only in that part of the juvenile period during which young are fed partially digested food by the parents. Birds differ from mammals in 1 or another aspect of their carbohydrate metabolism.—*Oscar Riddle.*

3516. Riddle, O., and T. Minoura. **Effects of repeated transplantation of whole suprarenals into young doves.** Proc. Soc. Exp. Biol. and Med. 20: 456–461. 1923.—Permanent grafts were not obtained in young grafted at 5–10 days of age, and 1–4 times later, though tissues from brothers and closely related individuals were partly used. A few grafts apparently

obtained a blood supply and possibly functioned up to 10 days, but all were resorbed and may have been equivalent only to injection of this tissue. Grafted females matured somewhat earlier than the control, but had smaller ovaries. Testes of grafted males average larger than those of controls. The grafted of both sexes had slightly less body weight than the controls. Small numbers prevent any definite conclusion on the basis of this series alone. Repeated injection of fresh ox suprarenal in slightly older doves gave results quite unlike those obtained with grafts.—*Oscar Riddle.*

3517. Sax, Karl. **A study of size factors through linkage relations with qualitative characters in Phaseolus.** [Abstract.] Anat. Rec. **26**: 388. 1923.

3518. Sax, Karl. **The relation between chromosome number, morphological characters and rust resistance in segregates of partially sterile wheat hybrids.** Genetics **8**: 301–321. *1 fig.* 1923.—The author finds in previous investigations that crosses between members of the Emmer group of wheat species with 14 chromosomes and members of the vulgare group with 21 chromosomes result in partially sterile F_1 plants and all degrees of sterility in F_2. In the F_1 and F_2, gametes and segregates with a chromosome number intermediate between 14 and 21 tend to be eliminated due to sterility, and the ultimate homozygous fertile segregates have either 14 or 21 chromosomes. A genetic and cytological analysis of 1 F_2 population showed that the 14-chromosome segregates all possessed the characteristics of the *durum* parent, and the 21-chromosome segregates resembled the *vulgare* parent, indicating that the character differences between the 2 groups are determined by factors in the 7 extra chromosomes. In view of this behavior the author concludes that the rust and drouth resistance of the *durum* wheats can seldom if ever be combined with the bread making qualities of the *vulgare* varieties. This conclusion is supported by the genetic data presented and by breeding experiments in all parts of the world. Disease resistance in varietal and species crosses is discussed. Pollen-grain size was found to be a fairly reliable index of chromosome number in wheat.—*Author's abstract.*

3519. Sax, Karl, and John W. Gowen. **The place of stocks in the propagation of clonal varieties of apples.** Genetics **8**: 458–465. *1 fig.* 1923.—French crab seedlings were budded in 1912 and 1913. In 1922 these trees in the orchard were extremely variable in size. The differences in size were closely associated with size in 1916 indicating that the small trees remain relatively small and that the large trees result in comparatively large productive trees after a number of years. Although the buds of each variety were selected from a single tree in each case, the resulting trees were just as variable in size as apple trees propagated in the usual way. The authors conclude that variable seedling stocks are an important factor in causing permanent differences in size and productivity. The results show that the larger grades of nursery stock will probably result in larger and more productive trees than smaller grades of the same age.—*Karl Sax.*

3520. Schrader, Franz. **The sex ratio and oogenesis of Pseudococcus citri.** Zeitschr. Indukt. Abstamm.- u. Vererb. **30**: 163–182. 1923.—Experiments showed that these coccids cannot reproduce parthenogenetically, the great excess of females found in nature being due to their greater conspicuousness and much longer life, and to the fact that the males, except in the last 2 instars, may easily be mistaken for females; the sex ratio of insects actually hatching is within the range of equality of the sexes. Oogonia show 10 chromosomes, primary oocytes 5 tetrads. The nucleus of the 1st polar body remains in the egg without dividing; its 5 dyads later congregate with the 5 chromosomes of the 2nd polar body into 1 triploid nucleus at the egg periphery. This triploid nucleus divides slowly to form a layer of giant cells covering part of the side of the egg. Meanwhile the egg nucleus has fused with the sperm nucleus in the center of the egg and divided rapidly to form many small cells most of which migrate out to line the remainder of the egg periphery. The giant cells, their position encroached upon, migrate by amoebid motion toward the symbiotic mycetocytes near the anterior pole, interdigitating among and enveloping them. Through aberrancies in mitosis they have now acquired 30 or more chromosomes and their nuclei are distinctive. They do not take part in other structures of the coccid. In contradiction to Shinji's description, the germ cells of the embryo arise from diploid cells of the germ band, derived from the fertilized egg nucleus. After the revolution of the embryo, the gonad "anlagen"

come to lie in contact with the symbiont-giant cell complex, and before the egg of the next generation is matured symbiont cells enter it, but the neighboring giant cells do not.—*H. J. Muller.*

3521. Sears, Paul B. **Disturbances in pollen maturation.** [Abstract.] Anat. Rec. **26:** 386. 1923.

3522. Shull, G. H. **The species concept from the point of view of a geneticist.** Amer. Jour. Bot. **10:** 221–228. 1923.—Species is the simplest concept for classification purposes. Species differences are not equivalent in different groups. Koelreuter's concept of species was one in which all forms would freely interbreed. Sterility however may depend upon only a single factor difference. Species vary in compatability. The author cites varieties and species of *Bursa* as examples. Certain varieties of *B. bursa-pastoris* produced almost completely sterile hybrids. Self-sterility is present in varieties of *B. grandiflora.* Interspecific crosses of *B.* species gave good illustrations of diverse compatabilities. *B. bursa-pastoris* × *B. Viguieri* hybrids were easily secured, but they were almost completely sterile; *B. bursa-pastoris* × *B. grandiflora* hybrids were rarely secured, and these showed only partial sterility, but *B. grandiflora* × *B. Viguieri* produce fully fertile F_2 hybrids. Further, *B. bursa-pastoris* and *B. Heegeri,* very distinct in appearance, are separated by a simple Mendelian difference expressed in capsule form, a feature unmodified by environment as leaf types are, and hence a good specific character. Biotypes are natural groups but not always coincident with species. In the Orchidaceae fully fertile hybrids are secured between species and genera. Undue increase in number of species decreases the value of the species concept just as inflation in currency decreases the value of the monetary unit, as, for example, the *Crataegus.* The author thinks it is advisable for taxonomists to designate minor groups by some simple terminology, avoiding the multiplicity of terms used by geneticists for such groups. Species names would thereby retain a high value in scientific exchange.—*J. Ben Hill.*

3523. Sinnott, E. W. **The inheritance of fruit shape in Cucurbita.** [Abstract.] Anat. Rec. **26:** 386. 1923.

3524. Sinnott, E. W., and A. F. Blakeslee. **Distinction between primary and secondary mutants in Datura in regard to: III. Internal anatomy.** [Abstract.] Anat. Rec. **26:** 390. 1923.

3525. Smith, Kirstine. **The standard deviations of fraternal and parental correlation coefficients.** Biometrika **14:** 1–22. 1922.—The author points out that the ordinary formula for determining the probable errors of fraternal and parent-offspring correlations is not correct where more than 1 entry (2 siblings or 1 parent and 1 offspring) is made from each family. With correlations based on families of varying size, no rational treatment of the probable error is possible. The formulae for families of any given size are worked out in the paper. For zero correlation as well as in any case in which only 1 entry is made per family, the formulae reduce to the ordinary ones based on the total number of entries. Otherwise the probable errors are intermediate between that based on the number of families and that based on the number of entries, as obtained from the ordinary formula. It is pointed out that unless the correlations are very small it is of little value to obtain data for more than 4 or 5 in a family.—*Sewall Wright.*

3526. Soal, C. W. **Variation as an organic function.** New Phytol. **22:** 161–185. 1923.—I. Empirical biology is a study of changes in different ways in material complexes, organs, tissues, cells, chromosomes, etc. The germ cell is an observed link in a series of biological events. It is desirable to devise a theory of development in other than physico-chemical terms. "Any sequence of environmental changes . . . . referred to as an organic activity." An activity is associated energy-reactions. The distinguishing characteristic of an organism is its individuality, recognized by the fact that its activities are functionally integrated, i.e., behaves as a unit. Functional integration is not confined to single organisms, but may be characteristic of relations between organisms as in symbiosis. "Functional integration is a unique biological phenomenon." Abnormal types of behavior are ascribed to functional dissociation of stable activity systems, e.g., cytological aberrations, foetal monstrosities, functional and mental diseases. Environments are the unspecialized primary

environment outside the organism and the specialized secondary environment comprising all matter within the sphere of its activities.—II. Throughout development the organism is conditioned by the physical equilibria between its various reactions. The explanations of the origin of germinal variations are: (1) the Lamarckian theory of functional inheritance, (2) theories assuming germinal variations to be spontaneous. The distinction between fortuitous and determinate is more important than between continuous and discontinuous variations. Darwinian survival is applicable to all except those not inherited and determinate variations.—III. Variation is regarded as a function not of the germplasm but of the whole organism since hereditary transmission implies some sort of functional interaction between germinal and somatic cycles.—IV. The question arises whether germinal variations are correlated with physiological efficiency, the latter defined in terms of energy. There has been a progressive increase of physiological efficiency in phylogenetic development as evidenced by the evolution of (1) photo-assimilatory apparatus of plants, (2) vascular system of pteridophytes, (3) circulatory and respiratory system of vertebrates, (4) nervous system of mammals, (5) social organization of insects. Progressive increase and stability in efficiency of these physiologically important characters implies mutual compensation in respect to the somatic function of germinal variations affecting them. Observed mutations, however, are confined to single physiologically unimportant characters, as hair and eye color in animals and petal color in plants, etc. In domesticated species the physiologically unimportant characters become plastic while the important ones remain unchanged. Pathological variations of important characters occur. The heritable variations are: (1) minute cumulative changes in stable functions mutually compensative increasing the efficiency of the organism; (2) variation in physiologically less important characters correlated with (1) and often large, discontinuous and differentiating species and genera; (3) sporadic individual mutations, affecting unimportant characters and giving specific adaptations and domestic varieties; (4) abnormal sporadic variations in important and physiologically stable characters; generally harmful, and eliminated by natural selection. Increase in efficiency in phylogenetic efficiency is regarded as an intrinsic property of the organism; environment as only a limiting factor.—V. The principle of environmental limiting factors in important, applicable to the whole of phylogenetic evolution. The condition is eventually reached in which little further improvement in physiological efficiency can be made in the particular type. Continued existence of archaic forms such as unicellular protozoans etc., can be explained in this way. Germinal and somatic cycles are 2 primary associated activity systems. Variations affecting activities that are highly integrated will be coördinated and their corresponding reactions mutually compensative.—*J. Ben Hill.*

3527. Sperlich, Adolf. **Weitere Untersuchungen über die phyletische Potenz an reinen Linien und Freilandmaterial von Alectorolophus hirsutus All.** [**Further investigations on phyletic potency in pure lines and in ordinary material of Alectorolophus hirsutus.**] Zeitschr. Indukt. Abstamm.- u. Vererb. **32**: 1–36. *2 fig.* 1923.—Phyletic potency is the sum of those internal conditions which carry on the race from 1 generation to another at or near normal development. In *Alectorolophus hirsutus* it was found that seed taken from different parts of the inflorescence behaved very differently in germination and later development. High germination may be accompanied by low survival (low potency) while plants resulting from very low per cent germination often or generally have very high potency. Phyletic potency may be modified by changed environmental conditions. Nanism and gigantism indicate a weakened phyletic potency. Phyletic potency of a mixed (meadow) population may be nearly destroyed by mowing at a time to kill the unripe capsules carrying seed of high potency. Potency variation must probably be ascribed to ferments or enzymes. In nature phyletically impotent plants are only to be found adjacent to normal populations. The effect of variations in potency upon the germ-plasm is undertermined.—*L. R. Waldron.*

3528. Stout, A B. **Clocking the avocado—a study in cross-pollination.** Los Angeles Times, Farm and Tractor Section *p. 2.* July 8, 1923. [Reprinted under title: **A study in cross-pollination of avocados in southern California.** Ann. Rept. California Avocado Assoc. —**1922–23**: *p. 29–45.* 1923.].—Avocado varieties fall into 2 well-defined groups with respect to the normal daily sequence of dichogamy: (A) those that shed pollen in the afternoon from

flowers open for the 2nd time and in the forenoon have flowers open for the 1st time with pistils receptive, and (B) those with the daily sequence the reverse of that of group (A). Interplanting varieties of the 2 groups affords the greatest opportunity for frequent cross-pollination of both during the limited favorable periods each day. Under inclement weather there is delayed opening and retarded closing of flowers, irregularity in the daily sequence with frequent overlapping of flowers in 1st and in 2nd periods on the same tree, etc. While this gives opportunity for close-pollination, controlled pollinations indicate that few fruit set under such conditions. In California honey bees are the most effective agents in carrying avocado pollen, being abundant visitors to flowers in both 1st and 2nd periods of opening. But for proper pollination they should shuttle back and forth from trees of one variety with flowers shedding pollen to trees of another variety with flowers open for the 1st time and pistils receptive. To facilitate this, interplanting of "A" with "B" varieties should be mixed and close.—*A. B. Stout.*

3529. Sumner, F. B. **The genetic status of subspecific characters in mammals.** [Abstract.] Anat. Rec. **26**: 396. 1923.

3530. Tedin, Hans. **Kornfördlingen pa Svalöf. [The breeding of barley at Svalöf.]** Nordisk Jordbrugsforskning **1922**: 365–379. 1922.—A summary is made of the barley breeding studies of Tedin. In the earlier period selection of pure lines from commercial races was chiefly practiced. During more recent times the crossing method has been used extensively. In the 1st few years after the crosses are made, the populations from the different crosses are compared with standard varieties. After 7–8 years the better crosses are determined and new races are then obtained from individual plant selections from these better crosses. Before introducing a new variety extensive comparative trials are made.—*A. P. Lunden.*

3531. Terho, T. **Vererbung einiger Wollcharaktere beim Mele-Schaf. [The inheritance of wool characters in "Mele" sheep.]** Zeitschr. Indukt. Abstamm.- u. Vererb. **32**: 37–60. *1 fig.* 1923.—The author investigated the character of the wool in crosses between the Border-Leicesters and Merinos, the breeds from which the "Mele" sheep have been derived. He finds that the thickness of the wool fibers is intermediate in F_1 and F_2 and varies only very slightly more in F_2 than in F_1, indicating that a large number of factors are involved. He finds variability in thickness within an individual fleece to be closely correlated ($+ 0.59 = 0.05$) with the mean thickness. The fine crimp of the Merino largely dominates over the coarse waviness of the Leicester, and again there is little difference between F_1 and F_2. Fully medullated fibers, characteristic of Leicester but not of Merino, were found very rarely in any of the crosses. It is concluded that wool characters practically follow blending inheritance, crosses giving a relative constant intermediate.—*Sewall Wright.*

3532. Thadani, K. I. **Linkage relations in the cotton plant.** Agric. Jour. India **18**: 572–579. *Illus.* 1923.—Crossing a naked-seeded (*A*) sparse-linted (*b*) type with a fuzzy-seeded (*a*) abundant-linted (*B*) type, the author obtained a naked-seeded, abundant-linted F_1 and segregation in F_2 as follows: 103 *AB:* 54 *Ab:* 53 *aB:* 0 *ab.* F_3 progenies of each F_2 individual were grown. All *Ab* and *aB*, representing the parental types, bred true and all *AB* segregated for both factors. These facts and the absence in the F_2 of the double recessive *ab*, the author interprets as indicating complete linkage of the factors *A* and *b* and *a* and *B*. Crossing a naked-seeded, sparse-linted, white-fibered cotton (*Abc*) with a fuzzy-seeded, abundant-linted, yellow-fibered cotton (*aBC*) there was close linkage, as before, of *A* with *b* and of *a* with *B* while *Cc* segregated independently in approximately a 3:1 ratio. When a red-leaved (*G*) cluster (*d*) cotton was crossed with a green-leaved (*g*) non-cluster (*D*) cotton, the F_1 was red-leaved, non-cluster (*GD*) and the F_2 segregation indicated a linkage of *G* with *d*. The evidence from F_3 was not obtained in this case. Crossing a smooth-seeded, lintless, green-leaved, non-cluster cotton (*AbgD*) with a fuzzy-seeded, abundant-linted, red-leaved, cluster cotton (*aBGd*) the F_1 was *ABGD* and the F_2 showed only 9 of the 16 phenotypes to be expected if there was no linkage. The F_2 population was small, however ($n = 77$). The results, as before, indicated linkage of the factor pairs *Ab*, *aB*, and *Gd*, *gD*. There was also an indication of linkage of the factor pairs *BG*, *bg*, and *Ag*, *aG*.—*T. H. Kearney.*

3533. Tjebbes, K. **Ganzfarbige Samen bei gefleckten Bohnenrassen. [Self-colored seed in mottled bean varieties.]** Ber. Deutsch. Bot. Ges. **41**: 217–224. 1923.—Self-colored

beans in various proportions were found to occur in certain mottled-bean varieties; intermediate types never appeared. The mixture was at first attributed to hybridization but a test of the 2 types proved that this was not the case. It was found that the pods with self-colored seed appeared in groups and in a way which agreed with the presence of sectorial variegation and other forms of sectorial chimeras. The deviation is not inherited, i.e., the sex cells have not changed. The author states that the results are of interest especially because they concern a periclinal chimera which appears only as a sectorial chimera.—*Richard Wellington.*

3534. Turner, C. L. **A white-eyed mutation in the moth-like fly (Psychoda alternata) and the method of its transmission.** [Abstract.] Anat. Rec. **26**: 393. 1923.

3535. Ubisch, M. V. **Ergebnisse einiger Bastardierungsversuche an Spatangiden mit Echiniden (und Ophiothrix echinata).** [Results of a study of certain crosses between Spatangidae and Echinidae (also Ophiothrix echinata).] Arch. Zellf. **17**: 261–288. *Pl. 13–14, 3 fig.* 1923.—In crosses between *Paracentrotus* and *Echinocardium* little or no elimination of chromosomes occurred in early stages of the resulting hybrids (0–2 chromosomes eliminated). In crosses between *Sphaerechinus* and *Echinocardium* there was a striking amount of chromosome elimination (17 out of the 41 chromosomes in *Echinocardium* ♀ × *Sphaerechinus* ♂, and 6–8 in *S.* ♀ × *E.* ♂). *Paracentrotus* ♀ × *Echinocardium* ♂ resulted in plutei with skeletons like the mother. *Echinocardium* ♀ × *Paracentrotus* ♂, in early cultures, gave rise to plutei which were maternal as to their skeletons; but in certain of the later cultures the hybrids were at first Paracentrotus-like, changing to Echinocardium-like plutei. *Echinocardium* ♀ × *Sphaerechinus* ♂, and the reciprocal cross, resulted in plutei, the skeletons of which resembled the mother. *Echinocardium* ♀ × *Ophiothrix* ♂ gave plutei with the maternal type of skeleton, but resembling the fathers in having an opaque plasma. *Echinus* ♀ × *Echinocardium* ♂ gave very diverse races of plutei, while the reciprocal resulted in plutei which were strongly maternal.—*Ralph E. Cleland.*

3536. Uda, Hajime. **On maternal inheritance.** Genetics **8**: 322–335. *1 fig.* 1923.—Normal silkworms have slate-colored hibernating eggs. A variety selected from these had brown eggs. This variety was crossed reciprocally with the normal, and the progeny followed to F_4, with complete back-crosses, several hundred thousand eggs being classified. Females homozygous for slate gave exclusively slate eggs, and females homozygous for brown gave exclusively brown eggs, in F_1, regardless of the constitution of the male. Heterozygous females back-crossed by homozygous brown males gave equal numbers of slate and slate-brown eggs in the batches. These slate-brown eggs gave only brown offspring. Heterozygous females crossed by homozygous slate males gave slate eggs only. Heterozygous females by heterozygous males produced batches consisting of 3 slate to 1 slate-brown; hence the factor pair segregates in ordinary Mendelian fashion. The sperm has no visible effect on the eggs of a homozygous female. [The sperm produces only a partial effect in the recessive eggs (zygotes) of the heterozygous female.]—*John Belling.*

3537. Warren, Paul A. **Complementary factors for depth and fasciation in tomato fruits.** [Abstract.] Anat. Rec. **26**: 385–386. 1923.

3538. Whiting, P. W. **Conflict of instincts in gynandromorphs of Habrobracon.** [Abstract.] Anat. Rec. **26**: 395. 1923.

3539. Wilder, Inez W., and Elizabeth B. Peabody. **Hermaphroditism in Eurycea bislineata.** [Abstract.] Anat. Rec. **26**: 374.

3540. Woodworth, C. M. **Inheritance of growth habit, pod color and flower color in soy beans.** Jour. Amer. Soc. Agron. **15**: 481–495. *6 fig.* 1923.—Growth is considered indeterminate in that no terminal inflorescence is formed. Two types of growth habit were studied, significantly distinct in yield of seed per plant, time of flowering and maturity, height and node number. The 2 last named characters are strongly correlated. From natural crosses it is held that large type of growth is entirely dominant over small type, the 2 types segregating in a 3:1 ratio. Two pod colors, dark and light brown, studied in natural crosses showed monohybrid splitting. Purple flower color dominates over white, the 2 segregating in a monohybrid ratio. Purple flowers and stems and white flowers and green stems, respectively, showed perfect correlation.—*L. R. Waldron.*

3541. Wright, Sewall. **The relations between the piebald and tortoise-shell color patterns in guinea-pigs.** [Abstract.] Anat. Rec. 26: 393. 1923.

3542. Wright, Sewall. **The theory of path coefficients—a reply to Niles' criticism.** Genetics 8: 239–255. *8 fig.* 1923.—It is shown that Niles' criticism of the method of path coefficients [Genetics 7: 258–273. 1922] is based on a misconception of the purpose of the method and on incorrect mathematics in its application. The application of the method in dealing with causal relations, and its relation to multiple correlation and regression, are discussed briefly.—*Sewall Wright.*

3543. Yampolsky, Cecil, and Helene Yampolsky. **Distribution of sex forms in the phanerogamic flora.** Biblio. Genetica 3: 1–62. *9 charts.* 1922.—The data were taken from Engler and Prantls' Natürliche Pflanzenfamilien including the Nachträge until 1912. Data from all the published volumes of Engler's Pflanzenreich were added. Lists of the various sex forms and combinations, of which there are 43, are given with generic names and the number of species. The presence in nature of so bewildering an array of combinations of sexes, hermaphrodite, monoecious, polygamous, andromonoecious, gynomonoecious, dioecious, etc., etc., brings out the degree of sex-intergradation that obviously exists in the plant kingdom as a normal condition. In tables 1 and 1a are given the numbers of the various sex forms and their percentages respectively, as they occur among the monocotyledons and dicotyledons. More than 25% in both mono- and dicotyledons contain forms other than hermaphrodites. In table 2 the orders following Engler and Gilg's Syllabus der Pflanzenfamilien are listed and the numbers of genera and species in each listed under the headings hermaphrodite, monoecious, polygamous, polyoecious and dioecious. For a basis of comparison of the relative distribution of the above categories, the middle value and 1st and 3rd quartile were determined for each group. This brings out considerations as to the origin of hermaphroditism and dioecism based on evolutionary series according to Gilg. From the point of view of sex, plants occur in monomorphic, dimorphic, or polymorphic groups. Combinations of these groups give the possibility of multiplicity of sex combinations in plant forms. On the basis of function (cross and self fertility, sterility, proterandry, proterogeny) physiological sex intergradation in a multiplicity of combinations may be recognized. The relative distribution of all sex forms is listed in the 9 charts. From the charts and from table 2 it is evident that hermaphroditism, with the exception of a narrow gap between the Salicales and the Urticales, is represented in practically every order. Dioecism, numerically not as great as hermaphroditism, is of even wider distribution. With hermaphroditism and dioecism at the extremes of evolutionary series, development in either direction is conceivable.—*Author's abstract.*

HORTICULTURE

J. H. Gourley, *Editor*

John Bushnell, *Assistant Editor*

(See also in this issue Entries 3227, 3246, 3258, 3272, 3274, 3437, 3464, 3507, 3668, 3671, 3703, 3709, 3732, 3800, 3927, 3929, 3953, 4039)

FRUITS AND GENERAL HORTICULTURE

3544. Anonymous. **Overseas shipments of fruit. Reasons for failure.** Jour. Dept. Agric. Victoria 21: 31–33. 1923.—Most of the very large shipments turned out badly. The "battery and air circulation system" was decidedly more successful than steamers fitted with pipe grids in the holds for brine circulation. Apples and pears (chiefly apples) loaded at lower temperatures arrived in better condition than those loaded at higher temperatures. Where pre-cooling is impossible fruit stowing should provide for ample air circulation, especially in steamers fitted with pipe grids.—*Wm. E. Lawrence.*

3545. Anonymous. **Planting and reconstitution of vineyards. Conditions governing the distribution of Phyloxera-resistant vine rootings and cuttings.** Jour. Dept. Agric. Victoria 21: 320. 1923.—Except for changes in the dates for receiving applications the conditions are the same as for 1922 [see Bot. Absts. 13, Entry 911].—*Wm. E. Lawrence.*

3546. Anonymous. **Regulations regarding dried fruit.** Agric. Gaz. New South Wales **34:** 803. 1923.

3547. Adam, D. B. **Experiments in the storage of fruits.** Jour. Dept. Agric. Victoria **21:** 178–186. 1923.—Blackening of Kieffer pears, due to physiological changes, occurred more with storage at 34–37°F. than at 32°F. Wrapping had little, if any, effect on its development. Pears picked green kept better than when picked fully ripe. Attempts to isolate arbutin from the Kieffer pear, by the Bourquelot method, failed.—The effects of growth conditions, wrapping, temperatures, systems of refrigeration, care in handling, and conditions causing decay by organisms are also discussed in relation to keeping quality. The keeping qualities of nine varieties and their commercial storage are briefly summarized. [See also Bot. Absts. 13, Entries 3668, 3709.]—*Wm. E. Lawrence.*

3548. Arens, P. **Einige gegevens omtrent uitdunnen volgens het aantal melksap vaten en volgens productie- opnamen.** [**Comparison of thinning on the basis of latex vessel number and production measurements.**] Mededeel. Proefsta. Malang 37. *1–13, 1 fig.* 1922. [Reprint from Arch. Rubbercult. **6:** No. 10. 1922.] With summary in English.—Trees (763) 11 years old were observed for 6 months. Production measurements were taken and the number of latex vessels determined. Correlation between latex yield and latex vessel number was 0.61 ± 0.02. On the basis of the 30 measurements taken for each tree, a large number was selected and M and Σ computed. It was found that the standard deviation becomes greater when the mean is greater. The low yielders show less variation and they can be recognized very early because of that character. The high yielders show greater variations and therefore many more production measurements must be taken. Formulae and tables based on M and Σ indicate the number of times measurements must be taken for different yielders.—Thinning out on the basis of latex vessel number and on the basis of production measurements show that the latter is the more satisfactory method.—*Cecil Yampolsky.*

3549. Arthur, J. M. **The bracing of fruit trees.** Agric. Gaz. New South Wales **34:** 899–900. 1923.

3550. Belgrave, W. N. C. **Report of the plant physiologist for 1922.** Malayan Agric. Jour. **11:** 306–308. 1923.—Work has been almost entirely in connection with the rubber tree (*Hevea*). The field experiments are on yield and the laboratory work is on various properties of latex. Observations are made on tapping systems and bud-grafting.—*R. E. Holttum*

3551. Cock, S. A. **Citrus fruit export. Results of experimental shipments.** Jour. Dept. Agric. Victoria **21:** 294–307. 1923.—Recommendations for improvements of the citrus industry in Australia are given. Selection to produce the correct type of Washington Naval orange and the elimination of Navalencia and Thompson's improved varieties are recommended. Free use of nitrogenous fertilizers tends to produce large rough fruit.—The detailed report on 8 experimental transoceanic shipments pertains chiefly to oranges. A few lemons, grape fruit, and mandarins were also shipped. The best results were obtained from the newer districts where the growers "realize that to be successful, standard-grading machines, properly equipped packing sheds, and care and attention in cultural methods, and also in picking and handling, are necessary factors for successful export." Comments upon the boxes, packing, quality of fruit, wrapping paper, condition of fruit upon arrival, and prices obtained, are also given.—*Wm. E. Lawrence.*

3552. Dauvergne, J., et L. Weil. **Sur un procédé de bouturage en milieu liquide stérile.** [**A procedure for propagating by cuttings in a sterile culture solution.**] Compt. Rend. Acad. Sci. Paris **177:** 967–968. 1923.—Cuttings from wild grape, privet, and elderberry were used. The cut ends were burned over a flame and paraffined to prevent entrance of microorganisms. They were kept in a flourishing condition for about 6 months.—*C. H. Farr.*

3553. Esbjerg, Niels, og Erik Holten. **Forsög med Opbevaring af Frugt.** [**Fruit storing investigations.**] Tidsskr. Planteavl **29:** 329–392. *Fig. 5.* 1923.—The experiments were conducted in an ordinary fruit cellar, in a cold storage plant, and in a fruit storage house with insulated walls and ventilating system. After 5 years' experiments it was found that the keeping qualities of fruits vary considerably from year to year; a cold storage room is much superior to a cellar for apples and pears; ventilated fruit houses are superior to cellars in retaining the keeping qualities of the stored fruit; the temperature and duration of storage have little

effect on the flavor of apples; pears picked unripe and stored lose greatly in flavor while ripened pears lose little in flavor when stored. After 1 year's work it appears that the generation of ozone does not increase the keeping quality of the stored fruit; scab on fruits permits the entrance of destructive fungi and the keeping quality is thereby greatly reduced; tissue-paper wrapping does not seem to increase the keeping quality of stored fruit, but the appearance is improved; dry, finely powdered peat increases the keeping of stored fruit by at least a month; large fruit does not keep as well as small fruit, even from the same tree.—*Albert A. Hansen.*

3554. Farrell, J. **Passion fruit. Cultivation in Victoria.** Jour. Dept. Agric. Victoria **20**: 762–768. *Fig. 1–3.* 1922; **21**: 4–14, 163–170, 340–345, 405–412, 482–488, 603–611, 641–643. *Fig. 4–35.* 1923.—*Passiflora edulis* is described as to its history, climatic and soil requirements, propagation, cultivation, trellising, pruning, manuring, drainage and irrigation, habits of growth, flowering and fruiting, sterility, insect and fungous diseases, yield and marketing. —*Gleosporium* sp. is the chief disease. *Armillaria mellea* and collar rot (*Sclerotinia* sp.) also attack the plant. This evergreen vine grows rapidly, and responds easily to cultivation and manuring. Two crops are produced per year, although the earliest flowers may fail to set fruit. It is doubtful whether the Mammoth variety will prove to be as satisfactory as the common black, although the former is more resistant to insect pests and plant diseases.—*Wm. E. Lawrence.*

3555. Hillier, J. M. **Guayule rubber in Mexico.** Kew Bull. **1922**: 160. 1922.—The present status of the extraction of rubber from *Parthenium argentatum* is given.—*T. J. Fitzpatrick.*

3556. Howard, Stanley Herbert, Wheatley Alexander Robertson, and John Lionel Simonsen. **Note on the possibilities of camphor cultivation from Cinnamomum camphora in Northern India.** Indian Forest Rec. **9**[7]: 1–34. *Pl. 1–6.* 1923.—Some camphor is produced in India from plantations which have been generally successful. An acre of plantation when fully stocked should produce about 44 pounds of camphor annually from the cuttings and leaves, which is 1.39% of the oven dried weight of the collected material. While it is possible to establish successful camphor plantations in India, yields and prices do not permit of a profitable industry at the present time. Methods of distillation are described.—*E. N. Munns.*

3557. Jesness, O. B., and D. G. Card. **The marketing of Kentucky strawberries.** Kentucky Agric. Exp. Sta. Bull. 246. *30 p.* 1923.—Some details of picking, grading, and packing are considered.—*W. D. Valleau.*

3558. Kehling, H. W. **Friedrichhöher wetterfeste Parmäne. [Friedrichhöher weather-resistant Parman.]** Möllers Deutsch. Gärtnerzeitg. **34**: 141–142. *2 fig.* 1919.—From 1898 to 1918 this apple variety proved resistant to bad weather and frost. The trees are not entirely free from *Fusicladium.*—*J. C. Th. Uphof.*

3559. Maas, J. G. J. A. **Rapport betreffende het octrooi Fickendey. [Report on the Fickendey patent.]** Mededeel. Alg. Proefsta. A. V. R. O. S. Rubberser. 30. *7 p.* 1921. [Reprint from Arch. Rubbercult. **5**: 159–165. 1921.]—Report is based on data taken from experiments of de Jong at Buitenzorg. There appear to be no lasting effects from the increased tapping yields following the Fickendey patent. Increased production is due to deeper tapping and not to scraping. Scraping off the cork layer makes for deeper tapping cuts. [With English summary.]—*Cecil Yampolsky.*

3560. Maas, J. G. J. A. **Voorloopige mededeelingen betreffende de selectie van den oliepalm. [Preliminary report on selection in the oil palm.]** Mededeel. Alg. Proefsta. A. V. R. O. S. Alg. Ser. 15. *5–47. Pl. 4.* 1923.—In discussing types of oil palms the author accepts the classification of macrocarya (thick shelled), dura (medium-shelled), tenera (thin-shelled), and pisifera (shell-less). All except the last show a tendency towards genetic constancy. Import collections of oil palms in Buitenzorg were examined; in many instances it was found that seed had not bred true to type. The larger collections of Boggorredja (Lampongs), Sumatra, showed also that trees from seed imported from Africa in the main were not true to type.—*Cecil Yampolsky.*

3561. Meeking, E. **Fruit industry of Victoria. The present status and future outlook from a commercial standpoint.** Jour. Dept. Agric. Victoria **21**: 1–3, 115–116, 434–437. 1923.—The present position and future outlook of the fruit industry in Australia was greatly altered by the World War. During the war and up to 1919 increased exports caused much improvement. By 1920 prices had fallen to below pre-war level, while production costs were higher; and there was a falling in the export trade, as well as an increase in acreage and in production. In 1921 and 1922 the Commonwealth fruit pools relieved the situation. Increased local consumption and an expansion of the overseas markets is regarded as essential to the maintenance of the industry.—The 2nd and 3rd articles discuss statistics for 1912–21. During this time there was 18.7% increase in the acreage of 16 kinds of fruits and an increased yield of 4.8%. Apples, apricots, cherries, lemons, and oranges are the chief fruits affected. The greatest future increase will be in citrus fruits, and grapes for drying.—Apples constitute 50% of all the fruit grown in Australia. Victoria leads in the production of apples, peaches, pears, plums, and apricots. New South Wales leads in oranges, lemons, and cherries. Bananas are grown chiefly in Queensland and New South Wales.—In the immediate future the heaviest increases in quantity of fruit production will be as follows: "Plums, New South Wales; pears Victoria; apples, Victoria; peaches, Victoria and New South Wales; oranges, New South Wales; apricots, Victoria; cherries, New South Wales; lemons, New South Wales."—*Wm. E. Lawrence.*

3562. Peltier, G. L. **Orchard sanitation and hygiene.** Ann. Rept. Nebraska Hort. Soc. **52**: 108–118. 1921.

3563. Pescott, E. E. **Orchard and garden notes.** Jour. Dept. Agric. Victoria **21**: 61–62, 125–127, 189–191, 253–254, 445–447, 638–639, 701–704. 1923.

3564. Pynaert, Leon. **Les bananiers. [The banana.]** Bull. Agric. Congo Belge **11**: 353–406. 1920; **12**: 239–293, 530–566, 673–701. 1921.—A comprehensive discussion is presented of varieties suited to the conditions of the Belgian Congo, methods of cultivation, diseases and their control, and the utilization of the fruit. The manufacture of desiccated bananas, flour, starch, sago, compote and marmalade from the fruits is described, and numerous analyses of these products showing chemical composition and nutritive value are given. Some 20 pages are devoted to a discussion of the banana as a fiber plant. The treatment of the subject differs from that in Fawcett's book in that less attention is paid to methods of cultivation and more to the utilization of the fruit.—*Joseph S. Caldwell.*

3565. Tanner, H. E. **Berry growing on Vancouver Island.** Agric. Jour. [British Columbia] **8**: 220–221, 233. 1923.—Strawberries, loganberries, raspberries, and olivet cherries are discussed.—*J. R. Schramm.*

3566. White, C. T. **A thin-shelled variety of the Queensland nut (Macadamia ternifolia).** Queensland Agric. Jour. **20**: 93. *Pl. 15–16.* 1923.—A variety of this species is described with a shell 1 mm. in thickness and which can be opened with a penknife.—*W. D. Francis.*

3567. Wickson, Edward J. **The California vegetables in gardens and field.** 5th ed., *v + 319 p., 23 pl.* Pacific Rural Press: San Francisco, 1923.—This volume of 39 chapters is a manual of vegetable growing and covers a wide field including a history of the industry. The following chapters indicate the content: climate; soils; irrigation; drainage; cultivation; fertilization; location and arrangement; planting season; and propagation and planting. Chapters are also devoted to 23 vegetables or groups of vegetables; to sundries; canning and drying; seed-growing; garden protection; and weeds.—*J. H. Gourley.*

3568. Zörnitz, H. **Hübsche Kreuzblütler für Trockenmauer und Alpengarten. [Crucifers for dry walls and alpine gardens.]** Gartenwelt **23**: 33–34. *6 fig.* 1919.—A description, use, and cultural directions are given for *Arabis procurrens, A. albida, Aubrietia tauricola, A. Lavender, A. Moerheimi, A. Fireking, Alyssum saxatile flore plens, A saxatile citrinum, A. montanum grandiflorum, A. Moellendorfianium, A. Wulfenianum, A. pyrenaicum, Draba Dedeana, D. Salomono, Schieverckia Bormulleri, Iberis cordifolia, I. sempervirens* Weisser Zwerg, and *I. sempervirens* Schneeflocke.—*J. C. Th. Uphof.*

FLORICULTURE AND ORNAMENTAL HORTICULTURE

3569. Junge, Heinr. **Nymphaea tuberosa Gladstoniana und var. "Postlingberg." Nymphaea odorata "Rosennymphe."** Möllers Deutsch. Gärtner-Zeitg. **38**: 129–130. *1 fig.* 1923.—Postlinberg is suitable for deep ponds, develops strong growth, has large leaves and flowers, and is hardy. Rosennymphe, an improvement of *N. odorata rosea*, is a strong grower, flowers profusely, with leaves that are at first red and later dark green.—*J. C. Th. Uphof.*

MORPHOLOGY, ANATOMY, AND HISTOLOGY OF VASCULAR PLANTS

E. W. Sinnott, *Editor*

(See also in this issue Entries 3361, 3667, 3800, 3817, 3901, 3994)

3570. Bailey, I. W. **The cambium and its derivative tissues IV. The increase in girth of the cambium.** Amer. Jour. Bot. **10**: 499–509. *1 pl., 3 fig.* 1923.—Increase in girth of the cambium might be due to an increase in tangential diameter, length or number of fusiform initials, or to an increase in diameter or number of ray initials. The author shows that this increase is due primarily to increase in the number rather than in the size of the cambial cells. He here describes in detail only the fusiform initials and finds that among these there are 2 fundamentally different types of cambial activity. In the 1st, which is characteristic of Calamariales, Sphenophyllales, Lepidophytineae, Cycadofilices, Gymnospermae and those Dicotyledoneae which are less differentiated structurally, the fusiform initials are not arranged in regular rows. The anticlinal divisions are transverse or nearly so, and the products of these divisions elongate and crowd by one another, thereby producing an increase in the girth of the cambium. In the 2nd type, which is characteristic of certain highly specialized dicotyledons, the fusiform initials are relatively short, of nearly uniform length, and more or less symmetrically grouped in parallel, horizontal series; the bulk of the anticlinal divisions is radio-longitudinal; and the increase in the girth of the cambium is due primarily to the lateral expansion of the products of these divisions. The transition from the former (non-stratified) to the latter (stratified) arrangement closely parallels successive stages in the specialization of the vascular tissues, *e.g.*, the differentiation of vessels, libriform fibers, etc., and appears to be due to a progressive reduction of cell size and of longitudinal sliding growth in the cambium.—*E. W. Sinnott.*

MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. Transeau, *Editor*

L. H. Tiffany, *Assistant Editor*

(See also in this issue Entries 3325, 3328, 3368, 3369, 3658, 3700, 3701, 3702, 3733, 3816, 3824, 3837, 3847, 3982, 3983, 3989, 3990, 3991, 3992)

3571. Boeck, W. C. **Studies on Giardia microti.** Univ. California Publ. Zool. **19**: 85–134. *Pl. 1, 19 fig.* 1919.—The paper deals with the cycle of encystment in *Giardia microti*, the development of *Giardia* in the cysts, the parabasal bodies, and the treatment of giardiasis in rats. In the life history of *Giardia* there are 2 phases, vegetative and encysted. In the former there is binary fission or multiple fission into 8 daughter flagellates. During encystment there may be binary fission in the cyst, or an 8-zooid somatella may be formed in the cyst. The parabasal bodies are metabolic reserve centers of food materials and are connected with the motor activity of the organism. They are of cytoplasmic origin, acidophyllic in composition, and secret glycogen for use during the reproductive period.—*Harold Kirby.*

3572. Bullock-Webster, G. R. **Notes on Charophytes.** Jour. Bot. **60**: 148–149. 1922. —New stations in the British Isles are recorded for *Chara canescens*, *Nitella batrachosperma*, and *N. spanioclema.*—*Adele Lewis Grant.*

3573. Chemin, E. **Flore algologique de Luc-sur-Mer et environs. [Algal flora of Luc-sur-Mer.]** Ann. Sci. Nat. Bot. 5: 21–94. *Fig. 1–3.* 1923.—An enumeration of 208 species of algae is presented, distributed as follows: 17 Cyanophyceae, 29 Chlorophyceae, 48 Phaeophyceae, and 116 Rhodophyceae. Diatoms are not included in the list, except for 2 species very common in the locality. The distribution and habitat of many of the species are given, together with more or less detailed notes of general interest. This flora is compared with those of similar localities elsewhere on the coast of France.—*Paul Weatherwax.*

3574. G., A. [Rev. of: Church, A. H. **The somatic organization of the Phaeophyceae.** Oxford Bot. Mem. 10. *110 p.* (see Bot. Absts. 12, Entry 543).] Jour. Bot. 6: 112–123. 1922.

3575. Gabriel, C. **Anomalie de l'oogone de Vaucheria de Baryana. [An anomalous oogonium of Vaucheria de Baryana.]** Compt. Rend. Soc. Biol. 89: 327–328. 1923.—After the oogonium was formed and had acquired all the external sexual characters of the female branch,—the antheridium meanwhile developing normally, it prolonged itself at the beak forming a new filament which ended in an antheridium and oogonium. This seems to indicate that while an oogonium may have all the external female characters, the sex at that point is not definitely determined. Since such anomalies have not been seen after the crosswall has been formed cutting off the oogonium, the formation of this wall may be connected with the deciding factor.—*Oran Raber.*

3576. Hovasse, R. **Quelques faits nouveaux concernant le parasitisme de Blastodinium et de Syndinium. [Some new facts concerning the parasitism of Blastodinium and Syndinium.]** Compt. Rend. Soc. Biol. 89: 321–323. 1923.—These forms belonging to the Peridineae are described as found parasitic in copepods and radiolarians. Observations on the probable origin of this parasitism are added.—*Oran Raber.*

3577. Kofoid, C. A., and O. Swezy. **On the morphology and mitosis of Chilomastix mesnili (Wenyon), a common flagellate of the human intestine.** Univ. California Publ. Zool. 20: 117–144. *Pl. 15–17, 2 fig.* 1920.—*Chilomastix* is pyriform in shape; possesses a peripheral modification of the cytoplasm termed the spiral groove, a channel running over the body obliquely from the anterior end; has an anterior spheroidal nucleus with central karyosome and intranuclear rhizoplast; and shows a well developed neuromotor system. This neuromotor system is an integrated fibrillar system consisting of a centrosome on the nuclear membrane; a rhizoplast connecting this with the primary blepharoplast; a transverse rhizoplast connecting the 3 blepharoplasts; 3 flagella, 2 of which arise from the primary and 1 from the secondary blepharoplast; a posterior cytostomal flagellum and a parabasal from the tertiary blepharoplast; and a parastyle from the secondary blepharoplast. In mitosis the nuclear membrane remains intact and a paradesmose is spun out between the divided centrosomes. Duplication of the parts of the neuromotor apparatus is by outgrowth.—In structure *Chilomastix* is closely similar to the right side of *Giardia*, which possesses 2 nuclei and is bilaterally symmetrical, so that the left half is the mirror image of the right. *Chilomastix* may be the source of the bilateral 2-celled Hexamitidae, but the latter could arise only by a complete morphological reversal from the sinistral to the dextral type of 1 of the 2 daughter schizonts at mitosis.—*Harold Kirby.*

3578. Kofoid, C. A., and O. Swezy. **Studies on the parasites of the termites. I. On Streblomastix strix, a polymastigote flagellate with a linear plasmodial phase.** Univ. California Publ. Zool. 20: 1–20. *Pl. 1–2, 1 fig.* 1919.—*Streblomastix strix* is found abundantly in the hind gut of *Termopsis angusticollis*, usually attached to the epithelium of the intestine. It is of elongate form and possesses a long nucleus, 6 anterior flagella, 4 myonemes, a centrosome, a blepharoplast, and a rhizoplast, which orgenelles constitute the neuromotor apparatus. In binary fission there is simply a constriction of the elongated nucleus, followed by constriction of the protoplasmic body. Multiplication also occurs by multiple fission into a maximum of 8 zooids, preceded by the formation of giant individuals. The organism is placed in the family Streblomastigidae of the order Polymastigina.—*Harold Kirby.*

3579. Kofoid, C. A., and O. Swezy. **Studies on the parasites of the termites. II. On Trichomitus termitidis, a polymastigote flagellate with a highly developed neuromotor system.** Univ. California Publ. Zool. 20: 21–40. *Pl. 3–4, 2 fig.* 1919.—The purpose of the paper is to describe the neuromotor system in one of the simpler trichomonads. The species selected is a

flagellate living in the hind gut of *Termopsis angusticollis*, inhabitating the lumen of the canal, and feeding on woody particles. The neuromotor system is well developed. There is an undulating membrane, a parabasal body at the base of this, a centroblepharoplast from which arise 3 anterior flagella, and a rhizoplast connecting the centroblepharoplast to the nucleus. In mitosis the centrosome separates from the blepharoplast and a large paradesmose is spun out between the centrosomes. The formation of a paradesmose connecting the divided centroblepharoplasts is distinctive of mitosis in flagellates. The new flagella, parabasal body, and undulating membrane are formed by outgrowth. Multiple fission into an 8-zooid somatella occurs. The chromosomes, about 12 in number are V-shaped and are drawn to the ends of the paradesmose after a probable longitudinal splitting. *Trichomitus* differs from the usual trichomonads in having no axostyle.—*Harold Kirby*.

3580. Kofoid, C. A., and O. Swezy. **Studies on the parasites of the termites. III. On Trichonympha campanula sp. nov.** Univ. California Publ. Zool. **20**: 41–98. *Pl. 5–12, 4 fig.* 1919.—This flagellate, living in *Termopsis angusticollis*, has a metabolic campanulate shaped body with a narrower anterior end, an anterior cap-like operculum, and a very highly developed neuromotor system. The flagella are in 3 zones: an anterior zone of long flagella, a wide zone of short ones, and a 3rd zone of very long flagella which trail after and clothe the body. The flagella arise from rows of basal granules. There is an anterior centroblepharoplast connected by oblique fibers to these granules, a layer of transverse myonemes, and a layer of longitudinal myonemes. The nucleus is submedian and contains a "heterochromosome." The centroblepharoplast divides, spinning out a paradesmose and the ectoplasmic structures divide into 2 groups. The chromosomes split longitudinally before the prophase forming 52 threads, which subsequently unite by pseudosynapsis and part again on the spindle. The nuclear membrane is intact throughout the process.—*Harold Kirby*.

3581. Kofoid, C. A., and O. Swezy. **Studies on the parasites of the termites. IV. On Leidyopsis sphaerica gen. nov., sp. nov.** Univ. California Publ. Zool. **20**: 99–116. *Pl. 13–14, 1 fig.* 1919.—**Leidyopsis** is found in *Termopsis angusticollis*, but less abundantly than the other forms. It has the structural characteristics of *Trichonympha*, from which it is distinguished by the number and arrangement of the flagella. The neuromotor system resembles that of *Trichonympha*, but transverse myonemes are absent. The long flagella occupy the anterior third of the body and are of equal length. The nucleus is anterior and contains a "heterochromosome" like that of *Trichonympha*. The process of division is as in the other genus. In the prophase there are 48 chromosomes; this number is reduced to 24 by pseudosynapsis.—*Harold Kirby*.

3582. McCulloch, Irene. **A comparison of the life cycle of Crithidia with that of Trypanosoma in the invertebrate host.** Univ. California Publ. Zool. **19**: 135–190. *Pl. 2–6, 3 fig.* 1919.—The crithidial flagellates of the *Trypanosoma* life cycle and the flagellates of the genus *Crithidia* are closely similar structurally. The stages of the life cycles of the 2 genera are more parallel than is the case in any other herpetomonad and leptomonad flagellates. This affords evidence for the evolution of *Trypanosoma* from a crithidial flagellate. Multiple fission in *Crithidia eryophthalmi* is similar to multiple fission in *Trypanosoma lewisi* and trichomonads. The occurrence of endogenous buds in *C. euryophthalmi*, which are comparable to the latent bodies of *T. gambiense*, establishes another link between these groups.—*Harold Kirby*.

3583. Willie, N. **Karplanter og ferskvandsalger fra øerne Husøy, Ona og Røsholmen paa Nordmør. [Vascular plants and freshwater algae from the Husøy, Ona and Røsholmen islands in Nordmør.]** Nyt Mag. Naturvidensk. **61**: 53–89. *Pl. 1–2.* 1923.—During the summer of 1918 the author spent considerable time on the Husøy and Ona islands, studying especially the fresh-water algae but examining also the distribution of vascular plants. The main island Husøy is situated about 28 miles NNW of Molde (62°51′N.Lat.). The author discusses the different communities: (1) beaches; (2) seashore meadows; (3) rocky shore; (4) rocks proper; (5) crevices in rocks, and the glens; (6) natural meadows. The lichen heath. The cultural communities: (1) artificial meadows; (2) fields; (3) turf roofs; and (4) ruderals. Attention is called to the fact that the peat in eastern Norway is generally *Sphagnum* peat, whereas the formation of the western peat is not bound to the moors. The climatic conditions are typically atlantic. The annual rainfall is not large but the humidity is very great, and the limits

between the humid and the arid formations are very uncertain. The naked and low islands are very storm-beaten, and there are few calm days. The percentage of NaCl in the soil is very high, the spindrift being beaten by the gales across the islands. An alphabetical list of all vascular plants occurring on the islands is given.—On the 3 islands there are but few localities suitable for fresh-water algae, the richest localities being in the fresh-water pools on the rocks, where the excrement of sea-gulls furnishes an effective nitrogen source. The author is of the opinion that fresh-water algae are very generally spread by being attached to the feet or plumage of birds. A complete list of the fresh-water algae is given, the following new varieties and forms being described: *Merismopedia aeruginea* f. *ovata* n. f., *Lyngbya aerugineo-coerulea* var. *borealis* n. var., *Protococcus viridis* var. *minor* n. var. The giant bacterium *Hillhousia mirabilis* G. S. W. & Griffiths was found and the flagellate *Thallochrysis Pascheri* Conrad is described, the author being of the opinion that the genus can not be regarded as a member of the Crysomonads, and that the relation between *Thallochrysis* and the *Phaeophyceae* is more like that between *Tetraspora* and the Chlorophyceae.—*K. Münster Strøm.*

3584. Wislouch, S. M. **Beiträge zur Diatomeenflora von Asien.** [**Contributions to the diatom flora of Asia.**] Ber. Deutsch. Bot. Ges. **41**: 325–331. 1923.—A complete list of the diatoms of the Balschasch sea is given. They are divided into benthos and plankton forms. The algae were chiefly fresh water forms. A few belonged to brackish water; this was probably due to the fact that part of the year was dry and hot and the salt content increased. High mountain forms were also present, probably carried by birds.—*Hally Jolivette Sax.*

3585. Zimmermann, Walter. **Neue einzellige Helgolander Meeresalgen. Zugleich ein Beitrag Polaritätsfrage der Algen.** [**New one-celled Helgoland salt water algae. Also a contribution on the polarity question in the algae.**] Ber. Deutsch. Bot. Ges. **41**: 285–292. 1923. —The following algae are described: *Rhodomonas baltica, Platymonas tetrathele, Prasinocladus lubricus,* and *Chlorocystis Cohni.* Various polarity relationships in respect to axis of daughter cells are discussed.—*Karl Sax.*

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

(See also in this issue Entries 3294, 3310, 3650, 3982, 3983, 3989, 3990, 3992)

3586. Brotherus, V. F. **Musci novi japonici.** [**New Japanese mosses.**] Övers. Finska Vet.-Soc. Förhandl. **62**: (Avd. A.)[9]: 1–55. 1921.—The majority of the species and varieties here proposed as new were based on material from Japan itself. A few, however, were based (at least in part) on material from Corea, Formosa or the Liu-Kiu Islands. Many botanists contributed specimens. The paper includes the description of 1 new genus, **Weisiopsis,** with 5 species, as follows: *W. anomala* (Broth. & Par.) n. comb. (*Hyophila anomala* Broth. & Par.) from Corea; *W. Cardoti* n. nom. (*H. weisiaeformis* Card.) from Corea and Japan; *W. coreensis* (Card.) n. comb. (*H. coreensis* Card.) from Corea; *W. japonica* n. sp. from Japan; and *W. plicata* (Mitt.) n. comb. (*H. plicata* Mitt.) from Usagara and Madagascar. The other new species and varieties, numbering 107, are the following: *Acanthocladium Nakanishikii, Amblystegium flaccidum* Broth. & Yas., *A. nitidulum, A. Uematsui, Anacamptodon japonicus, Anoectangium didymodontoides, A. gymnostomoides* Broth. & Yas., *A. spirale, Anomobryum japonicum, A. Yasudae, Anomodon Uematsui, Aulacopilum japonicum, Barbula comosa* var. *japonica, B. laevifolia* Broth. & Yas., *B. planifolia* Broth. & Yas., *B. Tamakii, B. tosaënsis, B. unguiculata* var. *proligera, Blindia japonica, Brachythecium laxitextum, B. minutum, B. Tsunodae, B. Uematsui, Brotherella formosana, B. planissima, Bryhnia tenerrima* Broth. & Yas., *B. turgescens* Broth. & Yas., *Bryum argyrobryoides* Broth. & Par., *B. cochleatum, B. formosanum, B. Gonoi, B. mollissimum* Broth. & Yas., *B. nanoalpinum, B. ventricosum* var. *vestitum, Calyptothecium formosanum, Campylopus akagiensis* Broth. & Yas., *C. Uii, Chionostomum rostratum* var. *microcarpum, Claopodium subaciculum, Clastobryum Katoi, C. Tsunodae* Broth. & Yas., *Ctenidium brevipes, C. tenerum, Cyathophorella Aoyagii, C. japonica, Dicranella ditrichoides, D. microcarpa, Didymodon obtusissimum, Ditrichum macrorrhynchum, Duthiella japonica, Entodon macrosporus, E. Okamurae, E. Sakuraii, Fissidens Ferriei, F. tosaënsis, Funaria*

lutschiana, Gollania macrothamnioides, Haplohymenium Gonoi, H. obsoletinerve, H. piliferum Broth. & Yas., *Hygrohypnum purpurascens, Isopterygium byssaceum, I. kiushiuense, I. perrobustum, I. subfulvum, I. Tsunodae, Leucoloma Okamurae, Macromitrium comatulum, M. gymnostomum* var. *robustum, M. Okamurae, Mielichhoferia Sasaokae, Miyabea thuidioides, Mnium microblastum, M. Nakanishikii, Molendoa japonica, Neckera Konoi, N. Uematsui, Oligotrichum mamillosum, Pireella formosana, Plagiothecium delicatulum, P. Kuroiwae, P. obtusissimum, P. squamatum, P. tosaënse, P. turgescens, Pterobryum subarbuscula, Pylaisia serricuspes, Rhaphidostegium lutschianum, R. Nakanishikii* with the new var. *longipes, Rhynchostegium Ibshiiae, Stereodon pulcherrimus, S. pulchroalaris* Broth. & Yas., *S. Tamakii, Tayloria argutidens* Broth. & Yas., *Thamnium grandirete, T. planifrons* Broth. & Yas., *Tortella Sakuraii, Trematodon atrovirens, Tripterocladium japonicum, T. robustulum, Vesicularia apiculata, V. japonica, V. Okamurae, V. Tamakii,* and *Webera densiretis* with the new var. *breviseta.* Unless otherwise stated the author is authority for all new names.—*A. W. Evans.*

3587. Brotherus, V. F. [Note.] Meddel. Soc. Fauna et Flora Fennica 46: 57. 1921.—The discovery on the island of Åland of *Cynodontium suecicum* (Arn. & Jens.) Hag. and *C. polycarpum* var. *laxirete* Dix. is announced. Both mosses were found by J. O. Bomansson, and represent additions to the flora of Finland.—*A. W. Evans.*

3588. Burnham, S. H. **Camptothecium nitens var. falcifolium Ren.** Bryologist 23: 92. 1920.—The author states that the above is the correct name for *Camptothecium nitens* var. *falcatum* (Peck) Burnham. [See Bot. Absts. 13, Entry 1809.]—*E. B. Chamberlain.*

3589. Culmann, P. **Contribution à la flore bryologique du bassin supérieur de l'Alagnon (Cantal).** [**Contribution to the bryological flora of the upper valley of the Alagnon (Cantal).**] Rev. Bryologique 50: 65–71. 1923.—The first 3 installments of this paper on the bryophytes of central France have been abstracted [see Bot. Absts. 12, Entry 5759; 13, Entries 978, 1810.] The present installment concludes the treatment of the mosses and brings the work as a whole to a close. The mosses listed number 88, only 1 of which is designated as new to the Auvergne region. Each species is accompanied by full data regarding stations, and in several cases critical notes are added.—*A. W. Evans.*

3590. Culmann, P. **Notes bryologiques sur le Val des Bains (Auvergne) et ses environs immédiats.** [**Bryological notes on the Val des Bains (Auvergne) and its immediate vicinity.**] Bull. Soc. Bot. France 67: 100–110. 1920.—The present paper on the bryophytes of the Auvergne region of central France is supplementary to a report published in 1919 and bearing a similar title [see Bot. Absts. 13, Entry 979]. It is based on new explorations made during 1919, and attention is first called to the greater abundance of alpine species at altitudes of 1300-1700 m. than on the mountain-summits themselves. The list of species, accompanied by full data regarding stations, includes 53 mosses and 19 hepatics; of these 6 mosses and 5 hepatics are new to the Auvergne. In several cases critical notes are appended.—*A. W. Evans.*

3591. Culmann, P. **Notes sur les Dicranacées et en particulier sur le mémoire de I. Hagen sur cette famille.** [**Notes on the Dicranaceae and especially on the article by I. Hagen dealing with this family.**] Bull. Soc. Bot. France 67: 198–207. 1920.—After calling attention to the importance and originality of Hagen's studies on mosses the author discusses his conclusions regarding the Dicranaceae, some of which were apparently not well founded. This seems to be the case, for example, with his delimitation of the subfamily Dicranoweisoideae, distinguished by the artificial character of entire peristome teeth. The author criticizes also Hagen's new genera *Gongronia* (based on *Cynodontium strumiferum*) and *Scutellaria* (based on *Dicranum montatum* and *D. flagellare*), belonging to the subfamily Dicranoideae. He considers that both are artificial and invalid and recognizes in the subfamily only the 6 genera *Arctoa, Cynodontium, Dicranum, Oncophorus,* and *Orthodicranum,* which he distinguishes by means of a key. The rest of his paper is taken up with a critical discussion of *Dicranum neglectum* Jur. and *D. Sendtneri* Limpr. The 1st of these is reduced to a variety of *D. majus* by Hagen but maintained as a distinct species by the present author; the 2nd, as conceived by Hagen, included more than a single species, but the names which the segregates should bear are left undetermined.—*A. W. Evans.*

3592. Degen, Árpád. **A Rhynchostegiella algeriana (Brid.) Broth. [Rh. tenella (Dicks.) B. E.] felfedezése Magyarország területén. [Discovery of Rhynchostegiella algeriana in the Hungarian flora.]** Magyar Bot. Lapok 21: 22–23. 1922.—The author announces his discovery of this southern moss at 2 Hungarian localities in the lower valley of the Danube.—*A. W. Evans.*

3593. Dixon, H. N. **Camptothecium nitens var. falcatum (Peck) Burnham.** Bryologist 23: 92. 1920.—The author asks whether the correct name of the above variety is not *Camptothecium nitens* var. *falcifolium* Ren. [See Bot. Absts. 13, Entries 1809, 3588.]—*E. B. Chamberlain.*

3594. Dixon, H. N. **Some new genera of mosses.** Jour. Botany 60: 101–110. *Pl. 564.* 1922.—Seven new genera of mosses from Asia and Africa are here proposed and illustrated on the accompanying plate. To each genus a single species is assigned. The 1st, **Nanobryum** of the Dicranaceae, is based on *N. Dummeri* n. sp. of Uganda and Cape Province; the 2nd, **Chionoloma** of the Pottiaceae, on *C. induratum* (Mitt.) n. sp. (*Tortula indurata* Mitt. ms.) of Burmah; the 3rd, **Beddomiella,** also of the Pottiaceae, on *B. funarioides* n. sp. of the Nilghiri Mountains, India; the 4th, **Oedipodiella** of the Oedipodiaceae, on *O. australis* (Wager & Dixon) n. comb. (*Oediopodium australe* Wager & Dixon) of Natal and Cape Province; the 5th, **Chamaebryum** Thér. & Dixon of the Funariaceae, on *C. pottioides* Thér. & Dixon n. sp. of Cape Town; the 6th, **Physcomitrellopsis** Broth. & Wager, also of the Funariaceae, on *P. africana* Broth. & Wager n. sp. of Natal; and the 7th, **Dimorphocladon** of the Hookeriaceae, on *D. bornense* n. sp. of Borneo. Unless otherwise stated Dixon is the authority for the new names. Each genus is fully described and accompanied by critical remarks, and a key to the 16 genera of the Funariaceae is given in connection with the *Physcomitrellopsis.*—*A. W. Evans.*

3595. Ellen, Sister M. **The Marchantiaceae of Sinsinawa Mound.** Amer. Midland Nat. 8: 222–226. 1923.—This is a record for the seasons for the processes of fertilization, reduction division, and spore dissemination, in *Preissia cummutata, Marchantia polymorpha* and *Conocephalum conicum,* in the locality of Sinsinawa Mound, Grant County, Wisconsin.—*Sister M. Ellen.*

3596. Kirkconnell, Watson. **Some mosses from Boskung.** Canadian Field Nat. 35: 142. 1921.—The author gives a popular account of the mosses growing near Boskung Lake, Haliburton County, Ontario, and lists 34 species by their common names.—*W. H. Emig.*

3597. Lee, John R. **Some Clydesdale Sphagna.** Glasgow Nat. 8: 71–72. 1919.—*Sphagnum acutifolium* Ehr. vars. *rubellum* Russ., *gracile* Russ., *fuscum* Schp., and *quinquefarium* Lindb., and *S. Girgensohnii* Russ. are listed for the 1st time from the Clydesdale region of Scotland.—*Ray C. Friesner.*

3598. Lee, William A. **Irish Sphagna.** Irish Nat. 32: 121–123. 1923.—Two earlier papers bearing the same title have been abstracted [see Bot. Absts. 12, Entries 5045, 5046]. This paper gives a list of 34 varieties and forms new to County Wicklow and indicates the range in altitude of the various species present.—*W. E. Praeger.*

3599. Pearsall, W. H., and F. A. Mason. **Yorkshire naturalists at Bishopdale.** Naturalist 1922: 383–388. 1922.—The authors review T. W. Woodhead's Vegetation of Bishopdale and give notes on bryology, mycology, and plant galls.—*W. H. Burrell.*

3600. Persson, John. **Catharinaea angustata Brid. in Skåne.** Bot. Notiser 1921: 268. 1921.—The author reports the occurrence of the Catharinaea in the district of Skåne, Sweden. The moss was previously known from only 3 Swedish localities.—*A. W. Evans.*

3601. Podpěra, Josef. **Ad bryophytorum cisuralensium cognitionem additamentum. [Additions to our knowledge of the bryophytes on the western side of the Urals.]** Publ. Fac. Sci. Univ. Masaryk 1921[5]: 1–42. *27 fig.* 1921.—The present report is based on collections made by the author in 1917 in the vicinity of Ufa, Russia, among the western foothills of the Ural Mountains. His own specimens were supplemented by material collected by several local botanists, particularly J. A. Verejtinov. The enumeration of species includes 14 hepatics, 6 Sphagna, and 149 mosses, 10 of the last group being new to Russia. Data regarding stations, accompanying plants, and collectors are given under each species, and many of the more critical mosses are discussed in detail and illustrated. Although no new species are proposed, the author describes a new hybrid, *Physcomitrella patens* × *Funaria hygrometrica,* a new

subsp., *crassinervium* under *Eucladium verticillatum*, and the following new varieties: *Amblystegium Juratzkanum* vars. *Noskovi* and *Verejtinovi*, *A. varium* vars. *attenuatum* and *incrassatum*, *Leptodictyum Kochii* var. *depressum*, and *Leucodon sciuroides* var. *falcatum*. Several forms, some of which are new, are likewise distinguished. The paper is written in Latin throughout.—*A. W. Evans.*

3602. Podpěra, Josef. **Bryi generis sectionis Erythrocarpa Kindb. species europaeae.** [**European species of Bryum, section Erythrocarpa.**] Preslia **1922**: 81–89. 1923.—The author gives a critical revision of the 3 European species of Kindberg's section *Erythrocarpa* of the genus *Bryum*, the species included being *Bryum erythrocarpum* Schwaegr., *B. murale Wils.*, and *B. Sauteri* Br. Eur. Under *B. erythrocarpum*, 8 varieties and 1 subspecies are recognized, the following being proposed as new or representing new combinations: var. *Bomanssoni* (Lindb.), based on *Bryum Bomanssoni* Lindb.; subsp. *bornholmense* (Winkelmann & Ruthe), based on *B. bornholmense* Winkelmann & Ruthe; var. *gallicum;* var. *Hegelmaieri;* var. *pseudomarginatum* (Podp.), based on *B. pseudomarginatum* Podp.; var. *rubens* (Mitt.), based on *B. rubens* Mitt.; and var. *septentrionale*. The paper is in Latin.—*A. W. Evans.*

3603. Podpěra, Josef. **Nový zástupce čeledi Ephemeraceae na Moravé.** [**A new genus of the family Ephemeraceae in Moravia.**] Sborniku Klubu Prirodověde Kého za, Rok 1921 **4**: 1–4. *3 fig.* 1922.—The new genus here proposed is related to *Nanomitrium* Lindb. and bears the name **Aporella.** It is based on *A. moravica* Podp. n. sp., the material of which was collected by the author near Mohelno in Moravia at the base of serpentine rocks above the Jihlavka River. The paper is written in Czech but has a Latin résumé, from which the present abstract has been prepared.—*A. W. Evans.*

3604. Potier de la Varde, R. **Musci madurenses.** [**Mosses of Madura.**] Rev. Bryologique **50**: 72–79. 1923.—Two installments of this paper on Indian mosses have been abstracted [see Bot. Absts. 12, Entry 3385; 13, Entry 285]. The present installment enumerates 42 mosses, including as new: *Amblystegiella madurensis, Clastobryum oligonema, C. serrulatum, Ectropothecium Andrei, E. anisopterum, Entodon obtusatus, E. perplicatus* Thér. & P. de la V., *Neckera Andrei* Thér. & P. de la V., *N. semi-crispa, Pterobryopsis denudata* Dix. & P. de la V., *P. madurensis, Stereophyllum papillidens* Card., and *Vesicularia subulicuspis*. In addition, 3 new varieties are described: *Oedocladium Warburgii* C. M. var. *stenophyllum*, *Pterobryopsis madurensis* var. *flexipendula*, and *Rhacopilum Schmidii* var. *breviaristatum* Card. Except where otherwise stated Cardot and Potier de la Varde are the authorities for all new names. The new species and varieties are fully described and compared with their allies, while all the species listed are accompanied by data regarding stations and collectors.—*A. W. Evans.*

3605. Rilstone, F. **Cornish Sphagna.** Jour. Botany **60**: 263–267. 1922.—The author gives notes on the distribution and habits of growth of the various forms of *Sphagnum* occurring in East and West Cornwall. His list of species numbers 26, most of which are represented by several varieties or forms.—*Adele Lewis Grant.*

3606. Watson, W. **A new variety of Orthodontium gracile Schwaegr.** Jour. Botany **60**: 139–141. *1 fig.* 1922.—The new variety here proposed, var. *heterocarpa*, was based on material collected between Greenfield and Crowden, in Cheshire, England, and additional specimens were afterwards found in Yorkshire. The figure illustrates capsules of the new variety and also of the typical form of the species.—*Adele Lewis Grant.*

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. Fitzpatrick, *Editor*

D. S. Welch, *Assistant Editor*

(See also in this issue Entries 3315, 3599, 3671, 3672, 3676, 3678, 3681, 3684, 3686, 3688, 3689, 3692, 3694, 3695, 3721, 3731, 3733, 3749, 3848, 3892, 3902, 3903, 3904, 3909, 3912, 3914, 3921, 3922, 3937, 3982, 3983, 3986, 3989, 3990, 3992)

FUNGI

3607. Baudyš, Ed., a Rich. Picbauer. **Šestý příspěvek ku květeně moravských hub. [Sixth contribution to the mycological flora of Moravia.]** Sborník klubu přírodovědeckého v Brně 5: (1–14.) 1923.—This is an annotated list of slime molds and fungi from Moravia, Czechoslovakia. No new species are recorded, but several are new to Moravia, and others are reported from new localities. There are 7 species of Myxomycetes, of which 3 are new to Moravia: 17 of Phycomycetes (1 new); 106 of Basidiomycetes (6 new); 52 of Ascomycetes (5 new); and 97 of Fungi Imperfecti (24 new).—*B. Shimek.*

3608. Biourge, Ph. **Les moisissures du groupe Penicillium Link. Etude monographique. [The molds of the Penicillium group. A monographic study.]** La Cellule 33: 7–331. *Pl. 1–13 (col.), pl. 1–23 (black and white).* 1923.—This work includes an historical discussion of the group, a description of culture media and cultural methods, macroscopic and microscopic methods for examination of material, an extensive bibliography, and a systematic treatment of the genus *Penicillium*. The descriptions are supplemented by reproductions of living cultures in water color and line drawings of microscopic features. The following species of *Penicillium* are described as new: *P. albo-marginatum, P. aurantio-albidum, P. aurantio-violaceum, P. aurantio-virens, P. aureo-cinnamomeum, P. aureo-flavum, P. aureum-corda, P. auridorsum, P. auriflavum, P. baiiolum, P. brunneo-violaceum, P. candidum* (Roger Biourge), *P. capreolinum, P. chermesinum, P. chloro-leucon, P. chloro-phaeum, P. chrystis, P. chrysomphalum, P. cinerascens, P. citrio-sulfuratum, P. citrio-viride, P. cyaneo-fulvum, P. Dierckxii, P. Fellutanum, P. flavido-marginatum, P. flavidorsum, P. flavo-cinereum, P. flavo-glaucum, P. fusco-glaucum, P. griseo-atrum, P. Guégueni, P. Hickeyi, P. hypo-janthinum, P. implicatum, P. janthinellum, P. janthocitrinum, P. janthogenum, P. lanoso-grisellum, P. leucopus, P. luteoviride, P. Martensii, P. meleagrinum, P. obscurum, P. ochro-chloron, P. olivino-viride, P. pertardum, P. phaeo-janthinellum, P. porraceum, P. Psichydae, P. rosato-fragrans, P. rosatum, P. roseo-cinnabarinum, P. roseo-citreum, P. roseo-maculatum, P. rubens, P. Silton, P. suaveolens, P. sublateritium, P. Vermoeseni, P. virididdorsum, P. Wurceburgensi, P. Zukalii.*—*D. S. Welch.*

3609. Burt, E. A. **Higher fungi of the Hawaiian Islands.** Ann. Missouri Bot. Gard. 10: 179–189. 1923.—Sixty species of Basidiomycetes mostly collected by F. L. Stevens and C. N. Forbes (the latter collection in Bernice Pauahi Bishop Museum Herb.) are listed with notes or descriptions of the rarer forms. New species described are *Crepidotus rhizomorphus, Fomes fasciculatus, Poria fasciculata, Corticium granulare,* and *Epithele hydnoides.*—*S. M. Zeller.*

3610. Cordey, F. **Une localisation mycosique vulvo-vaginale due au Monilia albicans chez la femme enceinte. [A vulvo-vaginal mycosis in pregnant women caused by Monilia albicans.]** Compt. Rend. Soc. Biol. 89: 501–502. 1923.—The case is described. The cure for this, as in similar lesions, is local application of sodium bicarbonate and methylene blue.—*Oran Raber.*

3611. Costantin, J. **Sur le Pleurote du chardon bleu de la Vanoise. [Concerning the Pleurotus on the blue thistle of Vanoise.]** Compt. Rend. Acad. Sci. Paris 177: 849–852. 1923. —A new species, *Pleurotus Hadamardii,* on *Eryngium alpinum* is here described. It is found that fruiting of the fungus is stimulated by the mowing of the plants. The fungus behaves as a symbiont, unless the host is cut or injured, when it becomes parasitic. [See also following entry and Bot. Absts. 13, Entry 3671.]—*C. H. Farr.*

3612. Costantin, J. **Sur la récolte et la culture des Pleurotus d'Eryngium.** [**On the collection and culture of species of Pleurotus parasitic on species of Eryngium.**] Compt. Rend. Acad. Sci. Paris **177**: 921–924. *1 fig.* 1923.—In this continuation [see preceding entry] a history of the study of the species of *Pleurotus* on Eryngiums, especially of *Pleurotus Hadamardii*, and a bibliography are given. It is found that this species is edible and can be dried and shipped commercially. The distribution of its host, *Eryngium alpinum*, is given.—*C. H. Farr.*

3613. Dodge, B. O. **Morphology and hose relations of Puccinastrum americanum.** Jour. Agric. Res. **24**: 885–894. *5 pl.* 1923.—Serious injury to leaves and fruit of several varieties of raspberry by *Pucciniastrum americanum* (Farl.) Arth. in the vicinity of Washington is reported. The form of the uredinium varies from broadly lenticular to sharply conical, depending upon the host tissue in which it develops. The terminal cells in the chains composing the sorus primordium function first as a buffer tissue and persist as a peridium. Intercalary cells are regularly cut off below the buffer cells. The fact that the 1st spore initial may grow out from the basal cell as a whole while later ones form as buds from which pedicellate uredospores develop, suggests that intercalary cells and stalks of uredospores are homologous. The uredinia of *Pucciastrum Agrimoniae* and *P. Hydrangeae* develop in practically the same way. —*C. R. Shear.*

3614. Grove, W. B. **Coleosporium Narcissi, sp. n.** Jour. Bot. **60**: 121–122. 1922.—This fungus, found growing on leaves of *Narcissi poetici*, is described as new.—*Adele Lewis Grant.*

3615. Grove, W. B. **New or noteworthy fungi-IX.** Jour. Bot. **60**: 142–148. *Pl. 563.* 1922.—The following are described from the British Isles as new: *Leptothyrium Osmanthi, Leptostromella Polypodii, Gloeosporium Diervillae, Trullula Silphii, Cryptosporium Tami, C. hypodermium* var. *Silphii, Septomyxa Salicis*, and *Myxosporium incarnatum* var. *Roumegueri* f. *Corni*. *Leptothyrium gentianicolum* Bauml. is transferred to *Pycnothyrium* as *P. gentianicolum.—Adele Lewis Grant.*

3616. Hotson, J. W., and Lena Hartge. **A disease of tomato caused by Phytophthora mexicana sp. nov.** Phytopathology **13**: 520–531. *Pl. 22–23, fig. 1.* 1923.—A fungus, isolated from decaying tomatoes shipped from Mexico to the Seattle market in 1917, has proved to be a species of *Phytophthora*. It has been studied intensively in culture during 3 years and appears to be a new species. It produces conidia, chlamydospores, and oospores readily and on a great variety of media. The development and the germination of these were studied. Oospores were produced most readily at low temperatures, 8–10°C. Young tomato plants sprayed with a water-suspension of the conidia and kept under moist conditions wilted after 48 hours. A similar black wilt was produced by inoculating tomato plants by various other methods. Inoculated tomato fruits were entirely decayed by the end of 7 days.—*B. B. Higgins.*

3617. Killian, Ch., et V. Likhite. **Le développement du Hendersonia foliorum Fuck. [The development of Hendersonia foliorum.]** Compt. Rend. Acad. Sci. Paris **177**: 484–486. *Fig. 1–10.* 1923.—This fungus grows on leaves of *Salix Capraea*. It was formerly classified with the Fungi Imperfecti, but is now transfered to the Ascomycetes near *Ascobolus*, due to the discovery of the perfect stage, which is here described. Figures are given of conidia, conidiophores, ascogone, and asci.—*C. H. Farr.*

3618. Liro, J. I. **Über die Gattung Tuburcinia. [The genus Tuburcinia.]** Ann. Univ. Fennicae Abolnsis. Ser. A 1^1: 1–155. (*bibl. Turku.*) 1922.—Examination of the original material of Fries shows the genus to be identical with *Urocystis* Rabenh. Ten new species are described: *Tuburcinia Poae* Liro on *Poa pratensis* L., *T. Melicae* Lagerheim & Liro on *Melica nutana* L., *T. Lagerheimii* var. *obscura* Liro on *Juncus Gerardii* Lois., *T. ferruginea* Liro on *Allium ascalonicum* L., *T. antucensis* Liro on *Anemone antucensis* Roepp., *T. nivalis* Liro on *Ranunculus nivalis* L., *T. Ranunculi-auricomi* Liro on *Ranunculus auricomus* L., *T. Ulmariae* Liro on *Filipendula ulmaria* Max., *T. Cortusae* Liro on *Cortusa Matthioli* L.—*George L. Zundel.*

3619. Loubiere, A. **Sur un nouveau genre de Pyrénomycètes. [A new genus of Pyrenomycetes.]** Compt. Rend. Acad. Sci. Paris **177**: 209–211. *Fig. 1–10.* 1923.—A fungus with vegetative characters of *Monilia candida* is found with the perfect stage. It is given the name of **Nephospora** *Mangini* n.g. n. sp. Figures are given of conidia, germination of conidia,

condiophores, ascospores and their germination, section of the perithecium, and ascus. The perithecium resembles that of *Peristomium* and of *Fragosphaeria*.—*C. H. Farr.*

3620. Mackie, W. W., and G. E. Paxton. **A new disease of cultivated barley.** Phytopathology **13**: 562. 1923.—A disease of barley leaves, caused by a species of *Helminthosporium*, is generally distributed in California. The causal fungus is described as *Helminthosporium californicum* n. sp.—*B. B. Higgins.*

3621. Nishikado, Yoshikazu. **Effect of temperature on the growth of Helminthosporium Oryzae Br. D. Haan.** Ann. Phytopath. Soc. Japan 1^5: 20–30. 1923. [Text in Japanese; abstract from English summary.]—This paper deals with the relation of temperature to the germination of the conidia, the growth of the mycelium and the formation of conidia of *Helminthosporium Oryzae*. The optimum temperature for the germination of the conidia lies between 25 and 30°C. The minimum temperature for germination is 2°C. at which temperature the germtubes are abnormal in that they are spherical or elliptical and pronouncedly swollen, never linear. The maximum temperature for germination is 41°C., at which the germtubes are also spherical or elliptical, but smaller than those formed at 2°C. The best growth of the mycelium was secured at 27–30°C. The maximum temperature for the formation of the conidia is between 35 and 38°C., and minimum 5°C. Conidia formed at the optimum temperature are obclavate and curved; those formed at 5°C. are cylindrical, straight, and have a smaller number of septa; those at 30°C. are shorter and wider than those formed at 20°C. At the lower temperatures the conidia are dark in color, becoming lighter with rise in temperature. The thermal death point, in 10 minutes exposure, for the conidia is 50–51°C.; for the germinated conidia or hyphae, 48–50°C.—*L. M. Massey.*

3622. Potter, Frans de. **Sur l'action pathogène du Monilia albicans. [The pathogenic behaviour of M. albicans.]** Compt. Rend. Soc. Biol. **89**: 425–428. 1923.—*Monilia albicans* should be considered as playing an important pathogenic role especially in individuals with an enfeebled constitution where it may cause not only mouth and throat troubles but serious lesions in various organs. The organism and the type of lesion produced in guinea pigs, rabbits, and rats are described.—*Oran Raber.*

3623. Ramsbottom, J. **Amanita muscaria on Hampstead Heath.** Nature **112**: 791. 1923.—Contrary to the comment by Rosenheim [see Bot. Absts. 13, Entry 2726] this fungus is to be found in almost any clump of birch trees. It is not unlikely that its mycelium is concerned in forming birch mycorrhiza. *A. mappa* has been very abundant recently, but *Lactarius vellereus* rare. Apparent scarcity of such fungi may be due to failure to search for them at the proper time.—*O. A. Stevens.*

3624. Sartory, A., F. Piechaud, et C. Rudeau. **Angine chronique due à un Oospora et à une levure. [Chronic angina caused by an Oospora and a yeast.]** Compt. Rend. Soc. Biol. **89**: 43–45. 1923.—Diagnosis and treatment are given as well as the cultural characters of the organisms involved, thought to be *Oospora buccalis* and *Cryptococcus Rogeri*.—*Oran Raber.*

3625. Siegler, Eugene A., and Anna E. Jenkins. **Sclerotinia carunculoides, the cause of a serious disease of the mulberry (Morus alba).** Jour. Agric. Res. **23**: 833–836. *2 pl., 1 fig.* 1923.—This new species of *Sclerotinia* is described as causing a serious disease of the fruit of *Morus alba* L. The disease has been known to occur in several of the Southern [U.S.] States since 1900 and is characterized by greatly enlarged portions of the aggregated fruit. It has been popularly referred to as the "popcorn" disease. A typical sclerotium is formed preventing the development of the drupelets. The occurrence of the microconidial form of the fungus in the diseased fruit is noted. The most striking distinguishing feature is the presence of a prominent caruncle-like body on the concave surface of the ascospore.—*E. A. Siegler.*

3626. Siemaszko, W. **Fungi caucasici novi vel minus cogniti. [New or little known fungi from Caucasus.]** Acta Soc. Bot. Poloniae **1**: 1–10. *Fig. 5.* 1923.—The following species are described as new: *Mycosphaerella Asclepiadis, M. Braheae, M. Crini, M. Hederae helicis, M. Jasmini-officinalis, M. Moutan, Pleosphaerulina Houttuyniae, Physalospora Cocculi, Didymella Ulicis, Leptosphaeria Camelliae-japonicae, L. Chenopodii albi, L. batumensis, L. Vrieseae, L. Moutan, L. Cerei peruviani, Massaria batumensis, Phyllosticta Phyllostachydis, P. crinicola, P. Daphnes-ponticae, P. Houttuyniae, P. Nerii oleandri, P. Nuttaliae, Phoma Lonicerae,*

Macrophoma Evonymi-japonicae, M. Nelumbii, M. theicola, M. Saponariae, M. Sterculiae, Aposphaeria Montbretiae, Coniothyrium batumense, C. Choisiae, C. Alni, Camarosporium Phyllostachydis, Hendersonia Eriobotryae, H. Vrieseae, Stagonospora Ailanthi, S. Siriodendri, Septoria Dichrocephalae, S. Siegsbeckiae, S. Vrieseae, Colletotrichum Daphnes-ponticae, C. Eleagni, C. Passiflorae, Cryptosporium Camelliae, Cercosporella Viciae.—D. S. Welch.

3627. Takimoto, K. **On the vitality of Cercospora beticola.** Ann. Phytopath. Soc. Japan 1[5]: 43–44. 1923. [Text in Japanese; abstract from English summary.]—Spores of *Cercospora beticola* when kept in a dry condition in the laboratory retained their viability for 16 months. Spores from seed were viable until the end of April (sowing season) of the next year. Those from diseased leaves kept in caves did not germinate on May 1, but sclerotial bodies and mycelia in tissues remained alive throughout the winter. At Suwon, when diseased leaves were wintered on the soil it was found that the spores lost their viability by May 1, but the sclerotial bodies or mycelia in tissue were often capable of germination at this date. The same results were obtained at Heijo, where it was also found that a few spores taken from leaves near the bottom of the pile and which were covered with a thin layer of soil were viable. Spores from diseased leaves mixed with wet soil and kept in the laboratory 3–4 weeks failed to germinate.—*L. M. Massey.*

3628. Vincens, F. **Sur l'Aspergillomycose des abeilles.** [Concerning the mycosis of bees due to Aspergillus.] Compt. Rend. Acad. Sci. Paris 177: 540–542. 1923.—A fungus similar to *Asperillus flavus*, but having fruiting bodies like *Spicaria*, causes this disease.—*C. H. Farr.*

LICHENS

3629. Hillman, Johannes. **Eine neue Art der Flechtengattung Xanthoria Arn.** [A new species of the lichen genus Xanthoria.] Bot. Archiv 1: 313. 1922.—The new species *Xanthoria* (sect. *Euxanthoria*) *pruinosa* is described. The species is near *X. parietina.—William Siefriz.*

3630. Høeg, Ove. **The corticulous Norwegian Pertusariaceae and Thelotremaceae.** Nyt. Mag. Naturvidensk. 61: 138–178. *Pl. iii.* 1923.—The genera *Pertusaria, Varicellaria, Phlyctis* and *Thelotrema* are dealt with, the author regarding them as forming a biological group. Knowledge of their distribution is still far from complete. Descriptions are given of all forms occurring in Norway. The following new species, varieties and forms are described: *Pertusaria speciosa, P. subviridis, P. pertusa* v. *Havaasii, P. lutescens* f. *fagicola, P. globulifera* f. *isidiata.—K. Münster Strøm.*

3631. Watson, W. **Determination of lichens in the field.** Jour. Bot. 60: Suppl. I, 1–28. 1922.—This is a field key to the genera of lichens found in Great Britain. It is divided into 10 parts, based mainly on the characters of the thallus, the kind of algae associated with the fungus, and the nature of the apothecia or perithecia, if present.—*Adele Lewis Grant.*

BACTERIA

3632. Aynaud, Marcel. **La botryomycose (suppuration caséeuse) du mouton et de la chèvre.** [A botryomycosis (caseous suppuration) of sheep and goats.] Compt. Rend. Soc. Biol. 89: 215–217. 1923.—The isolation methods and cultural characters of an organism causing a botryomycosis in sheep is described. It is considered as belonging to the genus *Staphylococcus* rather than to *Botryococcus.—Oran Raber.*

3633. Bergstrand, Hilding. **Further studies on the morphology of bacteria.** Jour. Bact. 8: 365–371. *1 pl.* 1923.—The author was able to demonstrate spherical and club-shaped bodies in cultures of *Bacterium typhi, Vibrio cholerae*, and *Corynebacterium diphtheriae*, which he regards as chlamydospores. He could not demonstrate gonidiangia, asci, or other bodies which would indicate that bacteria reproduce sexually.—*C. E. Skinner.*

3634. Darling, Chester A. **Distribution of Bacterium coli in feces.** Amer. Jour. Public Health 13: 822–826. 1923.—*Bacterium coli* has been found in the feces of bear, goat, dog, cat, mouse, duck, snake, salamander, frog, and fish. There appears to be no way of distinguishing *B. coli* of human origin from those of other animal origin.—*C. A. Ludwig.*

3635. Holden, H. S. **A suggested scheme for the investigation of marine bacteria.** Jour. Marine Biol. Assoc. United Kingdom 12: 136–140. 1919.—The author recommends blood glucose agar, trypsin agar, and trypsin broth as most satisfactory media. Methods of preparation and details as to manipulation and culture are described.—*Marshall A. Howe.*

3636. Magheru, Alice. **Recherches expérimentales sur le bacille de Morgan.** [**Experimental researches on Morgan's Bacillus.**] Compt. Rend. Soc. Biol. 89: 643–645. 1923.—Morphological and cultural characters are given as well as the results of inoculations of rabbits and guineapigs.—*Oran Raber.*

3637. Mudd, Stuart. **The penetration of bacteria through capillary spaces. I. Motility and size as influencing filterability through Berkfeld candles.** Jour. Bact. 8: 459–478. *1 pl.* 1923.—Cultures of *Vibrio percolans* lose their motility at pH 5.3 or below, and simultaneously lose their ability to pass through a Berkfeld V candle. The same origanisms when motile pass through readily, but when the motility is temporarily supressed by ether or chloroform or chilling they no longer pass through the candle. *Vibrio comma* and *Erythrobacillus prodigeosus* (*Bacterium prodigeosum*), both motile, but larger than *V. percolans* were unable to pass through the V candle. None of the organisms was able to pass through the Berkfeld N candle which has smaller pores. Data on the diameters of the organisms and the pores of the filter are given. These studies show that the intergranular diameters are of critical importance in determining the penetrability of the filter by bacteria and that the relative number and sizes of the gross pores or lacunae may also be of critical importance. In some cases the motility of a culture may be the important factor in determining the passage of an organism through a filter.—*C. E. Skinner.*

3638. Mudd, Stuart, and Shields Warren. **A readily cultivable Vibrio, filterable through Berkfeld "V" candle, Vibrio percolans, new species.** Jour. Bact. 8: 447–454. 1923.

3639. Philibert et Cordey. **De l'action du Bacillus botulinus sur les albumines.** [**The action of B. botulinus on albumins.**] Compt. Rend. Soc. Biol. 89: 500. 1923.—A cube of egg white is rapidly dissolved by *B. botulinus* under anaerobic conditions in vitro. The cube of egg white is completely dissolved in 4–5 days at 37°C. This character should be added to the known list of characters for this form.—*Oran Raber.*

3640. Pons, R. **Bactériophage du pyocyanique.** [**The pyocyanase bacteriophage.**] Compt. Rend. Soc. Biol. 89: 77–78. 1923.—Isolation and culture methods are given.—*Oran Raber.*

3641. Reddish, George F., and Leo F. Rettger. **Clostridium putrificum. II. Morphological, cultural, and biochemical study.** Jour. Bact. 8: 375–386. 1923.—*Clostridium putrificum*, (*Bacillus putrificus* Bienstock) is a definite and distinct species, differing from both *C. sporogenes* and *C. cochlearius*. It differs from all other described anaerobes in that it utilizes proteins and peptones as sources of energy, but carbohydrates very slightly, if at all.—*C. E. Skinner.*

3642. Renaux, E. **Une méthode simple de coloration du Treponema pallidum et des Spirochètesen général** [**A simple method of staining T. pallidum and spirochaetes in general.**] Compt. Rend. Soc. Biol. 89: 420. 1923.—Place the material on oil-free slides. Fix in acidulated formol (2% formol plus 1% acetic acid) for 2–4 minutes. Rinse thoroughly in 95% alcohol and cover with a saturated aqueous solution of picric acid for 10 minutes. Wash in running water and stain for 10 minutes with phenolized gentian violet or Ziehl's fuchsin. Wash in running water and dry. The violet is better for research purposes but the fuchsin lasts longer and is better for demonstration.—*Oran Raber.*

3643. Sordelli, A. **Flore anaérobie de Buenos-Aires.** [**Anaerobic flora of Buenos-Aires.**] Compt. Rend. Soc. Biol 89: 53–55. 1923.—A new pathogen associated with gangrene is described. The name *B. oedematis sporogenes* is proposed. It belongs in the same genus as *B. sporogenes.*—*Oran Raber.*

3644. Staub, A., et C. Truche. **Diagnostic bactériologique du choléra des poules et de la typhose aviaire.** [**Bacteriological diagnosis of chicken cholera and avian typhoid (white diarrhoea).**] Compt. Rend. Soc. Biol. 89: 227–229. 1923.—Attention is called to the little known fact that the causative organism of chicken cholera, *Pasteurella*, can not grow in yeast extract while the avian typhoid organism can. The 2 organisms also differ markedly in their effect upon white mice. A mouse inoculated with chicken cholera dies in 12–20 hours and bac-

teria are easily found in the blood stream, while after an inoculation with the avian typhoid bacillus the mouse does not die until after 3–5 days if at all and a very careful examination of the blood must be made to find the bacteria.—*Oran Raber.*

3645. Vaudremer, Albert. **Formes filtrantes des Bacilles tuberculeux. [A filterable form of B. tuberculosis.]** Compt. Rend. Soc. Biol. **89**: 80–82. 1923.—A moniliform variation of *B. tuberculosis* is described which is acid-resistant and passes through an L3 Chamberland filter.—*Oran Raber.*

MYXOMYCETES

3646. Siemaszko, Wincenty. **Spis śluzowców z okolic Suchumu na Kaukazie. [Myxomycetes found near Soukhoum, Caucassus.]** Acta Soc. Bot. Poloniae **1**: 1–3. 1923.—The author reports a list of Myxomycetes found in the Botanical Garden at Soukhoum or in the vicinity of the town.—*D. S. Welch.*

PALEOBOTANY AND EVOLUTIONARY HISTORY

Edward W. Berry, *Editor*

(See also in this issue Entries 3328, 3399, 3968)

3647. Berry, Edward W. **A fossil flower from the Miocene of Trinidad.** Amer. Jour. Sci. **7**: 103–108. *Fig. 2.* 1924.—The author describes a very well preserved large fossil flower as **Lecythidoanthus** *Kugleri* gen. et sp. nov., representing the family Lecythidaceae.—*E. W. Berry.*

3648. Berry, Edward W. **Organic remains, other than diatoms, from the excavation.** Jour. Washington [D. C.] Acad. Sci. **14**: 12–24. *Pl. 1–3.* 1924.—The author describes the insect galls and plant remains found in a buried cypress swamp discovered in excavating for a hotel foundation on Connecticut avenue in Washington, District of Columbia. The genera represented are *Taxodium, Sparganium, Naias, Carex, Scirpus, Cladium, Dulichium, Polygonum, Chenopodium, Phytolacca, Castalia, Rubus, Ceratophyllum, Ranunculus, Prunus, Acalypha, Ilex, Vitis, Ampelopsis, Cornus, Leucothoë, Galium, Sambucus,* and *Viburnum.* Thirteen still existing species are determined specifically, 5 are tentatively named, and the balance are identified only as to genera. Several are no longer present in the flora of the District and the age is considered as late Pleistocene.—*E. W. Berry.*

3649. Berry, Edward W. **Pathological conditions among fossil plants.** *Pp. 99–108, pl. 12–13.* In: Moodie, R. L. **Paleopathology. An introduction to the study of ancient evidences of disease.** *576 p. Illus.* Univ. of Illinois Press: Urbana, Illinois, 1923.—This summary account briefly discusses causes of extinction, parasitism, cicatrization, fossil fungi and bacteria, hypertrophy and teratology.—*E. W. Berry.*

3650. Dixon, H. N. **Note on a moss in amber.** Jour. Bot. **60**: 149–151. *Illus.* 1922.—A fragment of moss embedded in a mouth piece made of amber is described. The specimen came from Burmah and was found in beds which are considered to be Lower Miocene. The moss is believed to be a fragment of a branch of either *Hypnodendron Reinwardtii* or *H. arborescens.*—*Adele Lewis Grant.*

3651. Francis, W. D. **The origin of black coatings of iron and manganese oxides on rocks.** Proc. Roy. Soc. Queensland **32**: 110–116. *Pl. 1.* 1920.—These coatings are regarded as the altered remains of lichens and of a rock-incrusting alga (*Hildenbrandtia*).—*W. D. Francis.*

3652. Fritel, P. H. **Sur deux espèces de Fougères nouvelles pour la flore fossile des meulieres de Beauce (Aquitanien). [Two species of ferns, new to the fossil flora of the millstone quarries of Beauce.]** Compt. Rend. Acad. Sci. Paris **176**: 1635–1636. 1923.—The species added are *Lygodium Kaulfussi* Heer and *Goniopteris stiriaca* (Ung.) Al. Braun.—*C. H. Farr.*

3653. Groves J. **The Charophyta from Clacton-on-Sea.** Quart. Jour. Geol. Soc. London **79**: 623. 1923.—From the Interglacial locality named, in Essex, England, the author describes 2–3 species of oospores of *Chara,* possibly representing the species *C. hispida* and *C. fragilis;* also fragments of stems and branches that may represent *C. vulgaris.*—*E. W. Berry.*

3654. Heer, Oswald. **Flora fossilis Groenlandica. Afbildninger af Grønlands fossile Flora.** [Illustrations of the fossil flora of Greenland.] Meddelel. Grønland 5: 1–27. *Pl. 1–109.* 1922.—This is a republication of the 109 plates of fossil plants from West Greenland described by the late Oswald Heer in 1882 and 1883.—*E. W. Berry.*

3655. Jeffrey, E. C. **The structure and origin of coking coals.** Science 58: 285–286. 1923.—It is maintained that coking coals owe their origin to the presence in them of wood material or "mother of coal" representing drift wood.—*E. W. Berry.*

3656. Kiaer, Johan. **Oversigt over Kalkalgefloraene i Norges Ordovicium og Silur.** [Account of calcareous algae of the Ordivician and Silurian of Norway.] Norsk Geol. Tidsskr. 6: 113–142. 1920.—This is an account in Norwegian with an English summary of the calcareous algae of the early Paleozoic (Ordovician and Silurian) of Norway, with their chronologic succession. Their importance as contributors to the limestone deposits of these ages is discussed. The number of species known from these horizons in Norway is 21, and they are found to be of great stratigraphic importance. The genera represented are *Girvanella, Hedstroemia, Sphaerocodium, Mastopora, Apidium, Coelosphaerium, Cyclocrinus, Arthroporella, Vermiporella, Rhabdoporella, Dasyporella, Palaeoporella,* and *Solenopora.*—*E. W. Berry.*

3657. Laurent, L., et P. Marty. **Flore foliaire Pliocène des Argiles de Reuver et des gisements synchroniques voisins (Limbourg Hollandais).** [Pliocene leaf flora of the Reuver clays and synchronous deposits in the vicinity in Dutch Limburg.] Mededeel. Rijks Geol. Dienst **B1**: 1–80. *Pl. 14.* 1923.—The authors describe the leaf impressions from the clays that furnished the fruits and seeds described by Clement and Eleanor M. Reid. The systematic part contains an elaborate comparative description of the following forms: *Sphaeria* sp., *Osmunda Strozzi, Glyptostrobus europaeus, Pinus* cf. *silvestris, Picea excelsa, Potamogeton* sp., *Populus tremula pliocenica, Populus alba pliocenica, Salix alba fossilis, Salix varians, Salix pentandra fossilis, Betula alba fossilis, Alnus elliptica pliocenica, Quercus roburoides* and vars. *cardanii* and *robur pliocenica, Carpinus betulus fossilis, Castanea vulgaris fossilis, Fagus silvatica fossilis, Ulmus campestris fossilis, Zelkova acuminata, Pterocarya denticulata, Nuphar canaliculatum, Liquidambar europaeum, Mespilus rigidinervis* n. sp., *Ilex falsani, Leguminosites* sp., *Fraxinus excelsior fossilis, Myrsine celastroides, Arbutus antecedens* n. sp. The species are divided into 3 categories: 17 are considered to be good botanical species, 8 are classed as documentary species, and 6 as doubtful species. Their method of study and probable climatic environment are discussed at length, the flora being considered to represent 3 groups of species: those still present in the temperate flora of northern Europe, those still living in southern Europe, and those of Oriental or American affinities and no longer represented in Europe. The authors regard the existing flora of Europe as representing the reduced remnants of the Holarctic Tertiary flora whose depauperation was brought about by the topographic and climatic changes of Pleistocene and post-Pleistocene times. They dissent from many of the opinions advanced by the Reids from their studies of the fruits of the same horizon, and regard the extension of the Mediterranean as a more efficient barrier than were the mountain chains of southern Europe. [See also Bot. Absts. 13, Entry 3665.]—*E. W. Berry.*

3658. Mann, Albert. **Diatom deposit found in the excavation.** Jour. Washington [D. C.] Acad. Sci. **14**: 26–32. *Pl. 4* 1923.—The author lists 78 species of diatoms from an excavation in the city of Washington, the following being renamed or described as new: *Navicula bihastata, N. cuneicephala, N. torta,* and *Stauroneis washingtoniana.* Most of the diatoms found are rare or unusual forms no longer represented in the District. A number are common to the Pleistocene of Alabama, where of 55 known species 44 are found in the Washington deposit. A number (65) are also common to a fossil deposit at Crane Pond in Massachusetts. —*E. W. Berry.*

3659. Noé, A. C. **Fossil flora of Braidwood, Illinois.** Illinois Acad. Sci. Trans. **15**: 396–397. 1923.—An abstract is presented of the Carboniferous flora from the mines at Braidwood. —*E. W. Berry.*

3660. Øyen, P. A. **Kalktuf i Norge.** [Travertine in Norway.] Norsk Geol. Tidsskr. **5**: 231–350. *Fig. 1–27.* 1919.—An elaborate account is given in Norwegian of the occurrences of calcareous tufa or travertine, which is so common in the Pleistocene and Recent deposits of Scandinavia, and which commonly contains plant remains, many of which are identified and

figured. These deposits have played a prominent part in the discussion of the environments of late glacial and post glacial times. They are grouped in the following chronological series: Portlandia stage, Littorina stage, Pholas stage, Mactra stage, Tapes stage, Trivia stage, Ostrea stage, and Mya stage.—*E. W. Berry.*

3661. Reid, E. M., and M. E. J. Chandler. **The Barrowell Green (Lea Valley) Arctic flora.** [In: Warren, S. H. **The late glacial stage of the Lea Valley.**] Quart. Jour. Geol. Soc. London **79**: 604–605. 1923.—The authors identify and list 48 species of plants from the late glacial deposits of the Lea Valley, England, and consider them to indicate an arctic or sub-arctic climate.—*E. W. Berry.*

3662. Reid, E. M., and M. E. J. Chandler. **The fossil flora of Clacton-on-Sea.** Quart. Jour. Geol. Soc. London **79**: 619–623. 1923.—The authors list 135 species from the Pleistocene of this locality in Essex, England, and conclude that they were for the most part temperate, dry soil forms. They are considered to have been contemporaneous with those of West Wittering and Selsey, i.e., Interglacial and younger than the Cromer Forest bed. *Crataegus clactonensis* and *C. reidii* are described as new.—*E. W. Berry.*

3663. Seward, A. C. **A supposed paleozoic angiosperm.** Bot. Gaz. **76**: 215. 1923.—The author attacks the validity of the paleozoic angiosperm genus *Angiospermophyton* recently described by Hoskins [see Bot. Absts. 13, Entry 1873]. He believes the structure found in the coal ball from an Illinois carboniferous stratum to be a specimen of the well known Medullosan (*Cycadofilicales*) petiole and not a monocot stem. He states "the institution of a new genus *Angiospermophyton*, I submit, is entirely without justification."—*B. W. Wells.*

3664. Seward, A. C. **The use of the microscope in palaeobotanical research.** Jour. Soc. Roy. Microsc. London **1923**: 299–302. *Pl. 11.* 1923.—A brief summary is presented of the scope and results of microscopic investigations in the field of paleobotany.—*Ralph E. Cleland.*

3665. Seward, A. C. [Rev. of: Laurent, L., et P. Marty. **Flore foliaire Pliocène des Argiles de Reuver et des gisements syncroniques voisins (Limbourg Hollandais). (Pliocene leaf flora of the Reuver Clays and synchronous deposits in the vicinity in Dutch Limborg.)** Mededeel. Rijks Geol. Dienst **B1**: 1–80. *Pl. 14.* 1923 (see Bot. Absts. 13, Entry 3657).] Geol. Mag. **60**: 556–557. 1923.

3666. Vernon, R. D. **Fossils from the Midland coalfields.** Geol. Mag. **61**: 45–47. 1924.—The author lists a number of Carboniferous plants from the Notts and Forest of Wyre coal fields in central England.—*E. W. Berry.*

3667. Zander, Robert. **Ein Beitrag zur Kenntnis der tertiären Braunkohlenhölzer des Geiseltals. [A contribution to the knowledge of the wood from the brown coal of the Geisel valley.]** Braunkohle **1922/1923**: 1–12. *Pl. 1–3.* 1923.—After discussing the structure of the tracheids in the ferns, lycopods, Equisetums, cycads, Ginkgos, conifers, and vesselless angiosperms *Drimys, Trochodendron,* and *Tetracentron,* and describing the methods used in macerating the lignified wood, the author describes and figures the types of tracheids observed, the bulk of which, according to the author, are most like those of *Trochodendron* and *Tetracentron.* He writes approvingly of the Arber & Parkin, and Hallier speculations on the origin of the angiosperms, and considers that these fossil tracheids represent a "missing link," which he christens *Trochodendromagnolia.* The material came from a mine near Lützkendorf in the District of Merseburg in Prussian Saxony, and is considered to be of Eocene age.—*E. W. Berry.*

PATHOLOGY

Frederick V. Rand, *Editor*

Lillian C. Cash and Harry Braun, *Assistant Editors*

(See also in this issue Entries 3230, 3258, 3259, 3272, 3307, 3315, 3389, 3414, 3416, 3418, 3420, 3421, 3423, 3425, 3426, 3431, 3449, 3463, 3496, 3518, 3537, 3544, 3545, 3547, 3553, 3554, 3558, 3564, 3576, 3599, 3611, 3612, 3613, 3614, 3616, 3617, 3620, 3621, 3625, 3627, 3637, 3649, 3799, 3823, 3825, 3836, 3869, 3922, 3929, 3946, 3965)

DISEASES CAUSED BY FUNGI

3668. Adam, D. B. **Experiments in citrus fruit storage.** Jour. Dept. Agric. Victoria 21: 307–317. *2 fig.* 1923.—Losses in citrus fruit due to physiological causes are small; mold fungi are responsible for practically the whole loss. Washington Navel and Late Valencia oranges were stored under different experimental conditions. (1) Temperature: 37°F. proved to be the critical temperature for the growth of molds. Gray mold, *Botrytis cinerea* Pers., affected over 60% of the wasted oranges in fruit from Tongala, while *Penicillium digitatum* (Fr.) Sacc. was the principal fungus in other shipments. The percentage of mold decreased approximately uniformly with the decrease in temperature; 34°F. is recommended as the best practical temperature because "spotting" is likely to occur at 32°F. (2) Wrapping paper: sulphite tissue paper is better than waxed paper because the latter retains the moisture transpired by the fruit, thus producing favorable conditions for the growth of fungi. (3) "Sweating": this process allows the fruit to transpire after picking for 3–14 days before packing. "Sweating" is very beneficial in the prevention of mold, especially in fruit from districts where *Botrytis* is common. "Black eye" may be prevented by this method. (4) "Spotting" or "blotching" of oranges: this is due to an infection by *Botrytis*, or to the injurious action of oils liberated from the rind. The theory is advanced that the variation in temperature when fruit is stored at about 32°F. causes condensation of transpired moisture on the fruit, and this would explain blotching due to fungus growth. Humidity would be less variable at higher temperatures.—Other fungi isolated from oranges in cool store were *Penicillium italicum* Wehmer; *Sclerotinia libertiana* Fckl.; *Alternaria Citri* Ellis and Pierce; *Pythiacystis citrophthora* Sm. and Sm.; *Dematium pullulans* De Bary; and *Cladosporium* sp. [See also Bot. Absts. 13, Entries 3547, 3709.]—*Wm. Lawrence.*

3669. Beauverie, J. **La Rouille jaune du blé (Puccinia glumarum) en 1923. [Yellow wheat rust.]** Compt. Rend. Acad. Sci. Paris 177: 969–971. 1923.—A violent invasion of Auvergne by this rust occurred in 1923. *Puccinia triticina* and *P. graminis*, the brown and black rusts respectively, also appeared in July of the same year. The metereological conditions were: preceding autumn and April very wet; winter, very mild; little rain during the critical period (30 days prior to heading and during heading), but conditions for retaining water good; a hot spell in May, followed by cooler weather. It was only during the middle of July, when the temperature suddenly rose, that the brown and black rusts appeared. They produced both urediniospores and teliospores, but the yellow rust developed only the former. This gave good opportunity for the experiment station to study the immunity and susceptibility of wheat varieties. The 200 varieties so tested were classified in 5 groups according to resistance. In each group the more prominent varieties, 66 in all, are listed.—*C. H. Farr.*

3670. Brittlebank, C. C. **Diseases of the cotton plant.** Jour. Dept. Agric. Victoria 21: 242–244. 1923.—Black rot or cotton wilt (*Fusarium vasinfectum* E. F. S.) and anthracnose (*Glomerella Gossypii* (Southworth) Edg.) have not been found in Australia. An undetermined pathogenetic Fusarium was found by experiment to be present on the lint of cotton seed. Seed treatments with H_2SO_4 for 20 and 40 hours gave 91 and 92% germination respectively. Seed treated with H_2SO_4, washed and allowed to stand for 1 week before planting, germinated as well as untreated seed. The addition of a small quantity of water to seed treated with H_2SO_4 caused the temperature to rise to 180°F. Seeds held in water at 180°F. for 5 minutes failed to germinate.—*Wm. E. Lawrence.*

3671. Costantin, J. **Une montagne champignonnière. Les rapports du Pleurote et du Chardon bleu.** [Pleurotus on Eryngium alpinum.] La Nature 1923: 390–394. *8 fig.* 1923.—*Pleurotus Eryngii* is reported as very abundant in Savoie on the stumps of *Eryngium alpinum* after the latter has been mowed. Prior to mowing the relation of the organisms is regarded by the author as a symbiotic one, but that after cutting, the fungus fruits and causes decay of the stumps. The author speaks of the regions in which *E. alpinum* is abundant and hints at the possibility of the "natural culture" of this edible fungus on a commercial scale. Test-tube cultures of *Pleurotus alpestre* with incipient fructifications are reported and figured; this species also grows on *Eryngium alpinum*. [See also Bot. Absts. 13, Entry 3612.]—*J. R. Schramm.*

3672. Costantin, J., et L. Dufour. **Une maladie secondaire du Chêne causée par le Polyporus (Phellinus) rubriporus.** [The secondary disease of oaks caused by Polyporus rubriporus.] Compt. Rend. Acad. Sci. Paris 177: 806–809. 1923.—In the forest of Fontainebleau a study was made of a disease of *Quercus robur* under observation for 4 years. The trees were always attacked in groups of at least 3 or 4. The fruiting bodies appear near the ground, are arranged either one above the other or at a single level, are sessile, and have brown pores. Five types of the disease are reviewed in detail.—*C. H. Farr.*

3673. Darnell-Smith, G. P. **Spraying experiments with apples at Bathurst.** Agric. Gaz. New South Wales 34: 824. 1923.—At Bathurst it has been determined that black spot [*Gloeosporium ampelophagum*] and powdery mildew [*Plasmopara viticola*] diseases of apple can be controlled by lime-sulphur applied at the same time and together with the lead arsenate sprays for the control of codling moth.—*L. R. Waldron.*

3674. Doran, W. L. **Toxicity studies with some copper fungicides.** Phytopathology 13: 532–542. 1923.—The object of this study was to determine the relative susceptibility of certain fungous spores to copper fungicides. At the same time useful data on the relative toxicity of these fungicides have been obtained. The susceptibility comparisons were made with the spores of *Gymnosporangium clavipes, Gymnoconia interstitialis, Uromyces caryophillinus, Cronartium ribicola, Puccinia Antirrhini, Alternaria Solani, Venturia inequalis, Rhizopus nigricans,* and *Botrytis cinerea*. The spores were germinated in drops of water on glass slides which had previously been sprayed with the fungicide and dried. Conidia of *Venturia inequalis* were most susceptible to the toxicity of copper. Urediniospores of the *Uredinales* were extremely resistant. The possibility of successful control of such rust diseases by spraying with copper fungicides is, therefore, very doubtful. The addition of sugar or molasses to a 4-2-50 Bordeaux greatly increased its toxicity.—*B. B. Higgins.*

3675. Fahmy, T. **The production by Fusarium Solani of a toxic excretory substance capable of causing wilting in plants.** Phytopathology 13: 543–550. 1923.—Cultures of a single spore strain of *Fusarium Solani* were grown in flasks of diluted Richard's solution for 1, 2, and 3 weeks. The cultures were then filtered and the filtrate divided into 2 lots, one boiled a few seconds and the other not boiled. Portions of each lot were then placed in test tubes and the cut ends of young broad bean [*Vicia faba* L.] plants inserted. Check plants were placed in tubes of pure diluted Richard's solution, in distilled water, and in air. In both boiled and non-boiled filtrate the plants wilted in 2–8 hours while in Richard's solution the plants lived 12–15 days. The medium was rendered strongly alkaline by the growth of the fungus, but wilting was not due to the alkalinity nor to the oxalates produced in the cultures. The toxic substance was thermostable and non-volatile.—*B. B. Higgins.*

3676. Fischer, Ed[uard]. **Aperçu des recherches effectuées à l'Institut Botanique de Berne sur la biologie des champignons parasites.** [Sketch of the researches carried out at the Berne Institute of Botany upon the biology of fungus parasites.] Congrès Path Vég.. Strasbourg. *P. 17–21.* Imprimerie Alsacienne: Strasbourg, 1923.—The author briefly summarizes the experimental studies of the past 30 years at this Institute. A short account is given of studies of the Uredineae, including new species discovered. The most important problem, however, has been the question of biological species, their specialization and their relation to small morphological species. This work may be called "experimental taxonomy" or "comparative biology." Specialization of parasitism in different groups of fungi has been studied. Among biological species there are often also minute morphological differences, and the study

of the limits, or more especially of the transitions between biological species and small morphological species has seemed more and more to the author to have great importance. Biometric methods were used in this study. Reference is also made to the entirely analogous phenomena in the relations between Bacteria and higher animals, noxious insects and higher animals, and to man among whom "biological species" are sensitive to pollen of certain plants while indifferent to that of others.—*Frederick V. Rand.*

3677. Foëx, Et[ienne]. **Quelques mots sur les modes d'hibernation des Erysiphacées. [Notes on the mode of hibernation of Erysipheae.]** Congrès Path. Vég. Strasbourg. *P. 37–41.* Imprimerie Alsacienne: Strasbourg, 1923.—The modes of hibernation are discussed under 3 categories: (1) hibernation in the ascospore stage; (2) hibernation in the vegetative condition in the interior of buds; (3) hibernation in the vegetative form on persisting leaves.—*Frederick V. Rand.*

3678. Godfrey, G. H. **Gray mold of castor bean.** Jour. Agric. Res. **23:** 679–716. *13 pl., 5 fig.* 1923.—During the last year of the World War about 70,000 acres of castor beans (*Ricinus communis*) were planted in the U. S. A. In regions that were excessively humid during the growing season a Botrytis developed on the inflorescences. In some fields as high as 100% loss was incurred. During the succeeding winter the perfect stage of the fungus developed in pure culture, and still later was found under field conditions. This fungus was described as *Sclerotinia Ricini* n. sp. The fungus is homothallic. Conditions favoring the development of apothecia in pure culture are abundant moisture, temperature near the optimum for vegetative growth of the fungus (25°C.), aeration, and light. On seed from diseased spikes the fungus lived for many months in the form of hyphae, conidia, and sclerotia. The disease was clearly brought to America on seed from India. The fungus was limited to the castor bean in its parasitic activity, and no great differences in varietal susceptibility were evident in a test including 20 varieties. Control by the application of fungicides proved impracticable, the growth of the plants being so rapid as to require too frequent application. Seed treatment by immersion in $HgCl_2$ solution and in formaldehyde killed adherent spores and removed light weight beans, which are the most likely carriers. Planting clean seed in localities where the disease is not already established will result in a crop free from gray mold.—*G. H. Godfrey.*

3679. Heurn, F. C. van. **Schimmeln van sheets. [Moldy sheets.]** Mededeel. Alg. Proefsta. A. V. R. O. S. Rubberser. 29. *13 p.* 1921. [Reprint from Arch. Rubbercult. Nederland.-Indie **5:** 74–76. 1921.]—On the East Coast of Sumatra during the wet months of November, December, and January mold appeared on the rubber sheets. A 4% formalin solution is recommended for sheets that show the mold. In cases where no mold appears treatment is not necessary.—*Cecil Yampolsky.*

3680. Humphrey, C. J. **The destruction by the fungus "Poria incrassata" of coniferous timber in storage and when used in the construction of buildings.** Proc. Amer. Wood Preservers' Assoc. **19:** 188–207. *3 pl.* 1923. [See Bot. Absts. 13, Entry 320.]

3681. Lehman, Samuel G. **Pod and stem blight of soybean.** Ann. Missouri Bot. Gard. **10:** 111–178. *Pl. 9–13, 13 fig.* 1923.—A pod and stem blight of soybean caused by *Diaporthe Sojae* Lehman n. sp. has been studied, diagnostic symptoms recorded, and control measures recommended. The distribution of the disease thus far recorded is limited to North Carolina. It causes a premature death of plants, a failure of young ovules to develop and a molding and decay of seed in later stages of development. Definite parasitism of the causal organism has been demonstrated. Pycnidia appear in abundance on diseased tissues but perithecia have been observed in culture only. Pycnospores are produced in the spring after the organism has overwintered in host tissues. The organism has been isolated from seed in April and May following the season in which they were produced by infected plants. Relatively high humidity is conducive to infection and dissemination. Pycnospores germinate over the range between pH 2.2 and 8.6 with optimum between 4.1 and 6.1. Light is essential to pycnidial development. Practices of sanitation, use of disease-free seed and crop rotation are recommended as control measures. [See also Bot. Absts. 12, Entry 5836.]—*S. M. Zeller.*

3682. Mackie, W. W. **Phytopathological notes. Foot-rot or Ophiobolus in California.** Phytopathology **13:** 561–562. 1923.—During the past year perithecia of *Ophiobolus graminis* were found on diseased culms of wheat and barley at Davis, California. Diseased wheat

plants have been collected at various points within the state during recent years, but previous to this no perithecia had been found.—*B. B. Higgins.*

3683. Marsais, P[aul]. **Maladie de l'esca.** ["Esca" disease of the vine.] Congrés Path. Vég. Strasbourg. *P. 64–70.* Imprimerie Alsacienne: Strasbourg, 1923.—This is an old and widely distributed disease, the exact cause of which had only recently been discovered. It has gone under a variety of names among the best known of which are "esca," "apoplexie," and "folletage." The malady is particularly characterized by the sudden death of the entire stem, and more often vines showing maximum vigor and health are the victims. The name "esca" was given because of the appearance of the tissues invaded by the fungi causing the disease. It was noted that the fungi found in connection with this disease grew well only in media containing tannin. Careful examination showed that the concentric development by discontinuous growth was preceded by secretion of an enzyme acting at a distance on the tannin contained in the cells. The latter were killed and then became a favorable medium for fructification of the mycelium.—It is by the emission and exosmosis of this enzyme that cells of the vascular ring are quickly killed and their sudden destruction coincides with the external symptoms of withering and falling of the leaves. Among the fungi which may cause the disease is a Fomes which Patouillard has related to *F. igniarius;* the other fungus, *Stereum hirsutum*, is more frequently the cause and is thus a very dangerous inhabitant of the vineyard. Fructifications are rare but reproduction takes place also by conidia and by sclerotia. These fungi are described, and suggestions for control are given.—*Frederick V. Rand.*

3684. Miyake, Chuichi. **On a brown shot hole disease of cherry leaves caused by Mycosphaerella cerasella Aderh.** Ann. Phytopath. Soc. Japan 1^5: 31–42. *1 pl.* 1923. [Text in Japanese; abstract from English summary.]—The brown shot-hole disease of cherry leaves is caused by *Mycosphaerella cerasella* Aderh., the ascigerous stage of *Cercospora cerasella* Sacc. The generic relationship of these 2 forms was demonstrated by comparative cultural studies of isolations secured both from ascigerous and conidial material. Inoculation experiments demonstrated the pathogenicity of the fungus on the following species of *Prunus: P. cerasus* [L.], *P. Yamasakura* var. *typica, P. Yamasakura* var. *spontanea* subvar. *hortensis* [Max.], *P. Itosakura* [Sieb.], and *P. Itosakura* var. *subhirtella* [Koidz].—*L. M. Massey.*

3685. Peltier, G. L., and W. J. Frederich. **Relative susceptibility of citrus fruits and hybrids to Cladosporium Citri Massee.** Jour. Agric. Res. 24: 955–959. 1923.—In connection with citrus canker investigations in Alabama, observations were made on the relative susceptibility of Rutaceae to scab. It was found that with the exception of *Poncirus trifoliata* all the wild relatives of citrus grown in the isolation field were non-susceptible to scab. With this exception, scab appeared to be strictly limited to citrus fruits and their hybrids. The species and varieties within a group varied in their susceptibility to scab. Susceptibility to scab varied not only from season to season, depending on weather conditions, but varied even within the same season. In most instances, scab susceptibility narrowed down to the reaction of the host plant to environmental conditions essential to scab infection and development of the disease.—*G. L. Peltier.*

3686. Petri, L[ionello]. **Sur la formation des chlamydospores chez l'Oidium des chênes. [Formation of chlamydospores in the Oidium of oaks.]** Congrès Path. Veg. Strasbourg. *P. 36–37.* Imprimerie Alsacienne: Strasbourg, 1923.—The author successfully infected young leaves of healthy oaks by applying pieces of dried leaves of the preceding year, bearing Oidium-spots. Examination demonstrated the absence of perithecia and the dead condition of hyphae and conidia. However, the constant presence of spheroidal hyalin bodies was noted in the over-wintered mycelium, and these bodies are described in some detail. The author believes them to be chalmydospores, formation of which is normally lacking in the other Erysipheae and which is evidence of regression in *Microsphaera quercina.* —*Frederick V. Rand.*

3687. Picado, C. **Sur l'action à distance des champignons phytopathogènes. [Action at a distance by phytopathogenic fungi].** Congrès Path. Veg. Strasbourg. *P. 28–34.* Imprimerie Alsacienne: Strasbourg, 1923.—It is known that various fungi in parasitized plants cause lesions at a distance: browning, or blackening of tissues, wilting, plasmolysis, etc. Toxins or diastatic products have been causally related to these phenomena by various authors.

Results of investigations along this line by E. W. Brandes, H. C. Young and C. W. Bennet, W. F. Bewley, R. J. Haskell, and P. Nobecourt are briefly summarized. The author then describes his own researches in which he has attempted to study comparatively the action of substances elaborated by fungi pathogenic and non-pathogenic to a given host, and the comparative effect of such substances from a given pathogenic fungus upon its host and upon plants not parasitized. The plants chosen were flagelot kidney bean and potato; the fungi, *Fusarium Solani*, *Verticillium albo-atrum*, *V. duboys*, and a saprophytic Penicillium grown in Richard's culture medium. The experiments include studies relative to exotoxins in the culture liquid, endotoxins in fresh extract of mycelium, and alcoholic precipitates from the culture liquid and from the filtered extract of mycelium. As a result of these studies the author concludes that the wilting of plants, browning of vessels, and dissolution of tissues is not in all cases due to the same cause. In general the injurious substances occur in the mycelium and pass into the culture medium only in old cultures where a large part of the mycelium is autolyzed. Often wilting is more accentuated with heated (100°C.) extracts than with those not heated; this would not be the case if the action were due to toxins or diastases. If it is assumed that fungi parasitic on plants produce, at least in certain cases, non-diastatic substances poisonous to plants, may not the action at a distance of certain of these fungi be considered as a chronic poisoning comparable to chronic emaciation which certain fungi produce in animals?—Nicolle and Magrou distinguish 2 types of poisoning: (1) intoxication properly so-called, and (2) ordinary poisoning or irritation. The practical interest of this question may be summarized thus: If the action is due to true toxins or to diastatic bodies it is possible to direct researches toward immunization; if it is an ordinary poisoning this line of endeavor must give way to a search for antidotes.—*Frederick V. Rand.*

3688. Pritchard, Fred J., and W. S. Porte. **Watery rot of tomato fruits.** Jour. Agric. Res. 24: 895–906. *4 pl.* 1923.—A watery rot of tomato fruits occurring in southern and eastern U. S. A. is caused by *Oospora lactis* form phys. *parasitica* n. f. This fungus infects pricked green and ripe fruits through punctures, and uninjured fruits through the stem scar. The minimum temperature for the germination of its spores, growth of its mycelium and its infection of tomato fruits is approximately 2°C., the optimum 30 and the maximum between 37.5 and 38.5°C. This fungus dissolves the middle lamella, penetrates the cell walls (apparently by enzymic action) and destroys the contents of the cells. Its infection of tomato fruits can be largely prevented by washing the fruit for 30 minutes in an aqueous solution of chlorid of lime 1:40, or formaldehyde (37%) 1:240.—*Fred. J. Pritchard.*

3689. Reinking, Otto A. **Comparative study of Phytophthora Faberi on coconut and cacao in the Philippine Islands.** Jour. Agric. Res. 25: 267–284. *12 pl., 5 fig.* 1923.—In 1919 the author (Philippine Jour. Sci. 14: 131–151) produced evidence indicating the identity of the organisms causing coconut (*Cocos nucifera*) budrot and blackrot and canker of cacao (*Theobroma cacao*). This is a continuation of these studies. The symptoms of the 2 diseases and the field characters of the fungus on both hosts are given with infection experiments showing that other Palmae were successfully inoculated by the stab method with the Phytophthora from coconut; that seedlings of *Archontophenix alixandraeae*, *Dypsis madagascariensis*, *Livistona rotundifolia*, *Normanbya merillie*, and *Pinanga insignis* were killed by the fungus and that it also infects seedlings of *Phoenix dactylifera* and *Ptychosperma mearthurii*. Certain cross inoculation experiments with strains from both hosts show that seedlings of *Annona muricata*, *Cocos nucifera*, *Hevea brasiliensis* and *Theobroma cacao* are severely infected; seedlings of *Annona glabra*, *Mangifera indica* and *Sandoricum Koetjape* are slightly infected; fruit rot of *Carica papaya*, *Lycopersicum esculentum*, *Malus malus* and *Theobroma cacao*, tuber rot of *Solanum tuberosum*, and blight of *Pisum sativum* are produced by both strains, with a consistant similarity in the attack of various hosts by each strain.—The physiological studies include growth characters on 4 media and relation to light, temperature and acidity, all showing a consistent similarity in both strains of the fungus. Characters and measurements of mycelium, conidiophores, conidia and chlamydospores are described and tabulated in detail, also showing similarity in the strains. On the basis of these studies the 2 strains are considered to belong to 1 species. Due to the absence of sexual spores in the hosts and in culture the fungus is placed in the Faberi group of the genus *Phytophthora;* and because of its close resemblance to *P. faberi* Maubl. in

several other characters it is considered identical with that species. Ashby's culture of the fungus from coconut budrot in Jamaica (*P. palmivorum* Butl.) is reported to be very much like that of the Phytophthora of coconut and cacao in the Philippines. However, the latter fungus is considered different because of the apparent absence of sexual spores. Strains of *Phytophthora* are also reported from the following diseased plants: *Hibiscus sabdariffa* with seedling blight, a citrus seedling and buds of budded plants with blight, *Musa textilis* with sucker rot, *Hevea brasiliensis* with blight, and apparently 2 strains from fruit rot and from blight of *Solanum melogena*.—*C. D. Sherbakoff.*

3690. Tisdale, W. H. **An effective method of inoculating barley with covered smut.** Phytopathology **13**: 551–554. 1923.—By removing the hulls from barley seed and then dusting with spores of *Ustilago Hordei* (Pers.) Kell. & Sw. a very high percentage of infection was obtained. Greenhouse tests with 12 varieties of barley indicated considerable variation in varietal susceptibility to this smut.—*B. B. Higgins.*

DISEASES CAUSED BY BACTERIA

3691. Blommendaal, H. N. **Het optreden van witte vlekken op crêpe. [The appearance of white spots on crêpe rubber.]** Mededeel. Alg. Proefsta. A. V. R. O. S. Rubberser. 33. *6 p., 1 pl.* 1921. [Reprint from Arch. Rubbercult. Nederland.-Indië **5**: 361–366. *1 pl.* 1921.]—From crêpe rubber, which showed distinct white spots, micrococcoid slime bacteria were isolated and grown in pure culture. These slime bacteria appear whenever moist coagulum (scraps or lumps) is stored in the open air. Infection occurs from slimy cement floors or Shanghai jars. Control measures consist in storing coagulum under water; crêpe must be smoked as quickly as possible and the floor and jars kept clean.—*Cecil Yampolsky.*

3692. Jennison, H. M. **Potato blackleg, with special reference to the etiological agent.** Ann. Missouri Bot. Gard. **10**: 1–72. *2 pl.* 1923.—Four species of *Bacillus* have been described as the etiological agent of the blackleg disease of potatoes. In order to determine the relationships some 12 "strains" of the blackleg bacillus were studied comparatively as to morphology, physiology, and cultural features. Special attention was given to the comparative study of the gas- and acid-producing function of the blackleg bacillus and this study led to a quantitative study of carbohydrate utilization. An examination and study of the literature was also made.—Below is presented a brief summary of some of the conclusions reached: (1) The strains studied were morphologically similar. That they were specifically identical was abundantly proved by extensive comparative studies of their cultural features and physiology. (2) The etiological agent of potato blackleg should be referred to as *Bacillus atrosepticus* van Hall. (3) The following names are to be considered only as synonyms: *Bacillus phytophthorus* Appel, *B. solanisaprus* Harrison, *B. melogenes* Pethybridge and Murphy. (4) The index number of 5312-32120-2110 is presented herewith in lieu of a fuller (revised) description of *Bacillus atrosepticus* van Hall. (5) This pathogene develops acid and gas in the presence of a number of saccharides. The gas-producing function is relatively weak but this capacity can be built up to a certain extent by constant cultivation in the sugars which it is able to utilize. (6) Quantitative determinations of carbohydrate utilization show that *Bacillus atrosepticus* van Hall can not hydrolyze potato starch or dextrine. (7) This organism secretes the enzymes invertase, lactase, and maltase (also other carbohydrases) as shown by its action on corresponding substrates.—*H. M. Jennison.*

3693. Leonard, Lewis T. **An influence of moisture on bean wilt.** Jour. Agric. Res. **24**: 749–752. *3 pl.* 1923.—It has been found at Redfield, South Dakota, that the initial stimulation given to the wilt disease organism (*Bacterium flaccumfaciens* Hedges) naturally in and on navy bean seed, by moistening with legume-bacteria cultures, culture media or water, is sufficient to cause appreciable damage to the crop. This condition may be largely overcome by planting selected seed or by using dry soil as an inoculating material.—*Author.*

3694. Mizusawa, Y. **A bacterial rot disease of saffrons.** Ann. Phytopath. Soc. Japan **1**[5]: 1–12. 1923.—This disease of saffron crocus [*Crocus sativus* L.] was first observed in Japan in 1909, but attracted no special attention until 1917. Corms, roots, sheaths, leaves and flowers stalks are attacked, the most severe injury resulting from corm lesions. A wilting, withering and gradual yellowing of the foliage from the top downward, noticeable in Decem-

ber, results from corm infection. The roots and corms are found to be dark brown in color. This is the common form of the disease resulting from successive culture in infected fields. In rare cases when diseased corms are planted in clean soil, infection occurs at some point of the sheath, followed immediately by yellowing of the leaves. The causal organism was demonstrated by inoculations to be a new species of bacterium, to which the name *Bacterium Croci* n. sp. is given. It resembles but is not identical with *Bacillus carotovorus* Jones, *B. omnivorus* v. Hall, *B. oleraceae* Harr., and especially *B. aroidae* Town. The group number is 221.2233032. *B. Croci* remains in the decayed plant parts and in the infested soil. It is disseminated mainly by transplanting diseased corms. The selection of healthy corms and disinfection of seed corms in saturated lime water for ½ hour are recommended for control.—*L. M. Massey.*

3695. Nakada, N., and K. Takimoto. **Bacterial blight of Hibiscus.** Ann. Phytopath. Soc. Japan **1**[5]: 13–19. *1 fig.* 1923. [Text in Japanese; abstract from English summary.]—An undescribed bacterial leaf spot of *Hibiscus* has been under observation in Korea since 1913. The cotyledons of young plants when 2–3 leaves are expanded are affected. The disease appears first as minute, circular, black spots which gradually enlarge, the margins finally becoming angular. The edges of the spots assume a whitish-yellow color or water-soaked appearance and when the leaves are severely attacked the entire plant becomes blackened and withered. The causal organism, *Bacterium Hibisci* n. sp., has been isolated and its pathogenicity established by inoculation experiments. Plants grown from seed treated with $HgCl_2$ 1:1000 or hot water at 55°C. for 10 minutes remained healthy, thus proving that the pathogene overwinters on the seed. The application of 5-5-50 Bordeaux mixture was found to greatly reduce the incidence of infection.—*L. M. Massey.*

3696. Thaysen, A. C., and H. J. Bunker. **The destruction of cellulose fibres and fabrics by micro-organisms, and the importance of the microscope in the study of this destruction.** Jour. Roy. Microsc. Soc. London **1923**: 303–310. *Pl. 12–13, 1 fig.* 1923.—Microorganisms, mainly bacteria, have been found to be a cause of the destruction which cellulose fibers suffer when exposed to retting. Methods for demonstrating microscopically the results of the activity of these organisms are described. American cottons appear to be more resistant than Indian or Egyptian cottons. Dew-retted flax is more resistant than that which is tank-retted. Jute and hemp fibers are also attacked by cellulose-destroying organisms, and disintegrate in the same way as do cotton and flax.—*Ralph E. Cleland.*

DISEASES CAUSED BY ANIMAL PARASITES (INSECTS, NEMAS, PROTOZOANS, ETC.)

3697. Baudyš, Ed. **Druhý příspěvek k zoocecidiologickému prozkoumání Moravy. [Second contribution to the zoocecidiological survey of Moravia.]** Sborník Klubu Přírodovědeckého v Brně **5**: (1–19). *5 fig.* 1923. [The first contribution appeared in Časopis Moravského Musea Zemského **1920**: 530–568. 1920.]—This is an annotated list of additional gall-producing mites and insects found in Moravia and Czechoslovakia, arranged according to the host plants. It contains 132 species of flowering plants belonging to 85 genera, with 164 kinds of galls. The latter are all new to Moravia or appear upon new hosts. This increases the total number of galls for Moravia to 1,152. Seven new species are listed, for the present only by generic names, of which 3 belong to *Cecidomyidarum*, and 1 each to *Eriophyidum*, *Aphidarum*, and *Cystiphora*. Twelve additional species are reported from new hosts. A brief résumé in French is given of the new and doubtful species.—*B. Shimek.*

3598. Franchini, G. **Inoculation de flagellés d'insectes dans le latex des Euphorbes. [Inoculation of flagellates from insects into the latex of Euphorbia spp.]** Bull. Soc. Path. Exot. **16**: 646–650. 1923.—Flagellates from the digestive tracts of *Musca domestica*, *Sarcophaga haemorroidalis*, *Calliphora erythrocephala*, and *Pentatoma ornatum;* and *Trypanosoma rotatorium* from the frog were inoculated into vigorous plants of *Euphorbia geniculata* or *E. exula*. In general all the inoculated plants were arrested in development, paler green than the check, with flowers and seed less numerous, lower leaves dried up, upper leaves showing yellow spots, latex watery, and starch grains fewer and frequently distorted. One plant of *E. exula* inoculated with flagellates from *Pentatoma* wilted and died. The infections reported here are similar to but less severe than those following inoculation of kala-azar into *Euphorbia ipecaquanha*. Flagellates introduced into plant latex are usually transformed into leishmaniform parasites;

various protozoans when introduced into the blood of animals also lose their flagella and become leishmaniform parasites. A general similarity may be recognized in the effects of protozoans on animals and on plants: in animals, a more or less pronounced anemia with diminution of haemoglobin and red corpuscles giving the effect of thinner and paler blood; in lactiferous plants, reduced vigor, chlorosis, a watery latex due to destruction of starch grains, and sometimes wilting and death.—*Philip Brierley.*

3699. Franchini, G. **Nouvelles recherches sur les protozoaires des plantes à latex. [New research on protozoans of lactiferous plants.]** Bull. Soc. Path. Exot. **16**: 655–659. *3 fig.* 1923.—The author found protozoans in the latex of *Euphorbia grandidens* and *E. nereifolia* at Bologna, in *E. officinarum* and *E. nereifolia* at Florence, and in *E. splendens* and *E. virosa* at Rome. The forms present were trypanosomes, trypanosomides, leishmaniform parasites, piroplasms, etc. Their size and shape may vary with the latex in which they develop. Some had pseudopodia and may show amoeboid movement. The author believes all these forms are widespread in the plant kingdom; they may occur in apparently healthy plants, but more commonly in diseased hosts.—*Philip Brierley.*

3700. Franchini, G. **Sur un flagellé d'une Asclépiadacée (Arauja angustifolia). [A flagellate of Arauja angustifolia.]** Bull. Soc. Path. Exot. **16**: 652–655. *1 fig.* 1923.—This parasite of the Herpetomonas type observed near Bologna, Italy, differs from *Leptomonas elmassiani* described from the same host in Paraguay and Uruguay. It was found in latex of stems and leaves of a diseased plant of *Arauja angustifolia*, but not in 2 healthy plants of the same species. The affected plant was partly defoliated, with yellowish-chlorotic leaves. The latex, more watery than normal and poorer in starch, contained the motile flagellates. The Herpetomonas type is most common, but elongated forms without flagella, leishmaniform parasites, and round individuals with nucleus only, occur also. A few forked forms were observed; a slight helical twisting was rare. Division is longitudinal, the blepharoplast dividing first. Round forms are 0.5–2 μ in diameter; long forms 8.5–11 μ × 1–4 μ; flagella, when present, 3–10 μ.—*Philip Brierley.*

3701. Franchini, G. **Sur un flagellé particulier d'une Urticacée (Ficus benjamina). [A flagellate of Ficus benjamina.]** Bull. Soc. Path. Exot. **16**: 650–652. *1 fig.* 1923.—A flagellate from the latex of an apparently healthy shrub of *Ficus benjamina* at Ferrare, Italy, resembles *Herpetomonas* except that it divides transversely rather than longitudinally. Individuals with and without flagella, as well as multiplication forms, are described and illustrated. In the process of division a cell with several nuclei and centrosomes becomes constricted until the halves are joined only by a short filament; as the halves move apart the filament is drawn out and breaks; 2 individuals with flagella result.—*Philip Brierley.*

3702. Franchini, G. **Sur un protozoaire d'Euphorbia cereiformis et sur sa culture. [A protozoan of E. cereiformis and its culture.]** Bull. Soc. Path. Exot. **16**: 642–646. *3 fig.* 1923. —A round or oval, sometimes slightly elongated protozoan, lacking flagella but showing amoeboid movement of the protoplasm was found in the latex of *Euphorbia cereiformis*. Round forms from latex measured 1–2.5 μ in diameter, oval forms 1–2 μ × 0.51 μ. The host plant was pale green, the latex watery, and starch grains were rare and deformed.—Pure cultures were obtained by pipetting parasitized latex into an autoclaved medium composed of equal parts ordinary bouillon and latex of *E. cereiformis*. The organism grew well in this medium, in bouillon + blood, and in "gelose"-human blood medium; flagella developed in all 3, though they were absent in the fresh latex of the host. Conspicuous differences in the size and form of this flagellate in the 3 different media add weight to previous observations that the composition of the medium plays an important role in the development and morphology of protozoans. In "gelose"-human blood medium the parasites are numerous, very motile, with flagellum generally short, posterior extremity of the body often cleft, nucleus commonly toward the anterior extremity, and with blepharoplast usually anterior but sometimes lateral. In bouillon + latex of *E. cereiformis* the form *Herpetomonas* predominates, the cleft type is less common, flagellum longer, nucleus near the middle with a punctiform blepharoplast close at the side or in front, and rhizoplasts are occasional. Leishmaniform parasites are rare. The dimensions of the flagellate in this medium are 5–10μ × 1.5–2.5μ; flagellum, 9–15μ. In bouillon + blood the flagellum is very long, posterior end of the body not cleft but sometimes spirally

curved, and nucleus near the center with blepharoplast in front and somewhat removed. Division of the parasite is longitudinal, the blepharoplast dividing first.—*Philip Brierley.*

3703. McClintock, J. A. **The transmission of nematode resistance in the peach.** Science 58: 466–467. 1923.—Peach pits from Florida planted in soil infested with nematodes in Georgia yielded nematode-resistant seedlings. The factor for resistance is seed-transmitted. —*C. J. Lyon.*

3704. McCracken, Isabel, and Dorothy Egbert. **California gall-making Cynipidae with descriptions of new species.** Stanford Univ. Publ. Univ. Ser. Biol. Sci. 3: 1–70. *2 pl.* 1922.—Of the 113 species listed 74 are parasitic on oaks, 4 on wild rose, 1 on *Rubus*, and 1 on *Microseris*. The remaining 32 are inquilines in the galls of other species. A review of the biology of gall-making and the gall-making Cynipidae is given.—*Roxana Stinchfield Ferris.*

INFECTIOUS CHLOROSES (MOSAIC AND PEACH YELLOWS GROUPS, ETC.)

3705. Allard, H. A. **Some possible relationships of the mosaic diseases.** Phytopathology 13: 555–557. 1923.—This is a general discussion of some of the pertinent problems in regard to mosaic diseases, as to cause, host relations, and the relation of plant lice and the possible relation of fungi and bacteria to overwintering of the infective principle.—*B. B. Higgins.*

3706. Brooks, F. T. **Virus diseases of plants.** Nature 112: 955. 1923.—This is an abstract of discussions at the British Association meeting at Liverpool. Paul Murphy reported that certain varieties of potatoes in which the symptoms remain dormant might act as carriers. H. M. Quanjer emphasized the role of aphids and mentioned transmission through abrasion of leaf hairs. He suggested that these maladies be called phloem diseases. T. Whitehead classified virus plant diseases as follows: (1) infectious chlorosis, transmissible by grafting only; (2) spike disease of sandal, showing neither abnormal starch accumulation nor phloem necrosis; (3) leaf roll of potatoes, showing starch accumulation and phloem necrosis, and transmissible by insects but not by expressed sap; (4) potato mosaic, showing neither starch accumulation nor phloem necrosis.—R. N. Salaman suggested that "virus" diseases of potato were probably not congenital, and that susceptibility to leaf roll was transmitted independently of susceptibility to mosaic disease.—*O. A. Stevens.*

3707. Oortwijn Botjes, J. **Het gebruik van onrijpe aardappelknollen als pootgoed. [The use of unripe seed potatoes.]** Cultura 35: 279–288. 1923.—As it has been demonstrated that leaf curl and mosaic affect healthy foliage during growth, it has been suggested that foliage infestation is less when the tubers have been harvested earlier. Several experiments are recorded which prove this statement. When, however, the tubers are harvested during outbreaks of Phytophthora infection and afterward kept under moist environment, spoilage may become considerable. It was also observed that when tubers are harvested early the crop is reduced.—*J. C. Th. Uphof.*

NON-PARASITIC DISEASES

3708. Anonymous. **Fruit tree diseases and their treatment. Collar rot of orange tree.** South African Fruit Grower 10: 5. *3 fig.* 1923.—This disease is induced by unsuitable soil conditions. The essential part of the curative process seems to be the exposure of the base of the trunk and of the main roots to the curative and drying action of light and air.—*L. J. Goldblatt.*

3709. Adam, D. B. **Experiments in the storage of fruits.** Jour. Dept. Agric. Victoria 21: 234–241. *1 fig.* 1923.—This continuation [see Bot. Absts. 13, Entries 3547, 3668] deals with apples. "The skin blemishes, scald, Jonathan spot, and flesh collapse are examples of physiological disturbances in apples." Scald is more severe at high temperatures than at low temperatures and in immature fruit than in mature fruit. "Efficient ventilation practically eliminates scald," except where other conditions for scald development are favorable. Wrapping fruit in oil paper is recommended. Rome Beauty, Rymer, Winter Majetin, and Stone Pippin were chiefly used in the tests. The cause of scald was not determined.—Jonathan spot was worse on Scarlet Non-Pariel than on Jonathans; it was also found on Rome

Beauty. There was no apparent connection between temperature or the refrigeration system and the development of Jonathan spot, but rather there is a close relation with maturity of fruit. "The orchardist must study maturity closely. If he picks too early scald develops; if he allows the fruit to remain too long on the trees, spot will develop in store. While Jonathan spot is the lesser of the two evils, it has been shown that if an apple is picked at a particular stage in its maturity, neither scald nor spot will develop appreciably."—*Wm. E. Lawrence.*

3710. Darnell-Smith, G. P. **Russeting of apples by Bordeaux mixture.** Agric. Gaz. New South Wales **34:** 828. 1923.—Bordeaux mixtures of different strengths with copper sulphate and lime of varying proportions were tried at Glen Innes to determine what mixture would result in minimum russeting. The experiment (which is being continued) indicated that a mixture as weak as 3–4–100 should be used to avoid russeting and that with certain varieties such as Dunn's and Jonathan an even weaker solution is necessary.—*L. R. Waldron.*

DISEASES OF UNKNOWN CAUSE

3711. Birmingham, W. A. **An uncommon condition of mandarin fruit.** Agric. Gaz. New South Wales **34:** 815–818. *4 fig.* 1923.—On mandarin oranges are found bright yellow depressed areas in the equatorial region upon which occur small pimple-like outgrowths due to expansions of the outer skin layer more or less completely filled with comparatively thin-walled cells. No suggestions are given as to the cause or nature of the malformation.—Associated with the foregoing at 1 locality was another abnormal condition consisting of small reticulated areas of ruptured oil cells resulting later in ochre colored scabs. It is suggested that this condition may be due to lack of humus in the soil.—*L. R. Waldron.*

3712. Darnell-Smith, G. P. **"Bunchy top" in bananas.** Agric. Gaz. New South Wales **34:** 846. 1923.—Attention is called to the importance of this disease, the cause and control of which have not yet been worked out.—*L. R. Waldron.*

GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE

3713. Allen, W. J. **Some notes on fumigation of citrus trees.** Agric. Gaz. New South Wales **34:** 897–898. 1923.—Fumigating with powdered calcium cyanide has been successfully carried out by blowing the dust under the tents. The new treatment is only ⅓ as expensive as the use of the ordinary cyanide and sulphuric acid treatment. Cost schedules are given.—*L. R. Waldron.*

3714. Birmingham, W. A., and I. G. Hamilton. **Diseases of the cotton plant.** Agric. Gaz. New South Wales **34:** 805–810, 877–886. *Fig. 4–12.* 1923.—The important diseases of the cotton crop found in various cotton-growing regions are briefly described, illustrated in part, and discussed from the standpoint of control and eradication. The following diseases are discussed: Angular leaf spot (*Bacterium Malvacearum*), crown gall (*Pseudomonas tumefaciens*), anthracnose (*Glomerella Gossypii*), cotton wilt or black-root (*Fusarium vasinfectum*), Texas root-rot (*Ozonium omnivorum*), sore-shin (*Rhizoctonia Solani*), internal boll disease (perhaps caused by several fungi), southern blight (*Sclerotium Rolfsii*, black rust or blight (*Macrosporium nigricantium*), false mildew (*Ramularia areola*), rust (*Uredo Gossypii*), Diplodia boll-rot (*Diplodia Gossypina*), Fusarium boll-rot (*Fusarium* sp.) Alternaria leaf-spot (*Alternaria* sp.), and other troubles including certain physiological diseases and root-knot (*Heterodera radicicola*).—*L. R. Waldron.*

3715. Brittain, W. H. **Five years' spraying and dusting experiments.** Ann. Rept. Fruit Growers' Assoc. Nova Scotia **1923:** 53–72. 1923.—After briefly detailing experimental results the merits of different materials and combinations are discussed. The general conclusion drawn is that any standard treatment is better than no treatment. The matter of choice depends upon the cost, convenience, equipment and individual location. Where apple-scab infestation is not over 40% it is usually well controlled by the dusting material at present in use. With large acreage a duster may well supplement the spray—the latter for pre-blossom sprays, the duster for later applications, or in weather not permitting insect sprays.— *Frederick V. Rand.*

3716. Capus, J. **Communication de J. Capus. [Address by J. Capus.]** Congrès Path. Vég. Strasbourg. *P. 53–57.* Imprimerie Alsacienne: Strasbourg, 1923.—The author briefly reviews the early work of Millardet and Gayon and the recent work of Villedieu on copper fungicides, and discusses his own observations and the researches by Bertrand, Melhus, and Priolan in explaining the diverse results obtained.—*Frederick V. Rand.*

3717. Chabrolin, C. **Valeur anticryptogamique comparée des bouillies cupriques et des buillies sulfocalciques. [Comparative fungicidal value of copper and of lime-sulphur sprays.]** Congrès. Path. Vég. Strasbourg. *P. 60–62.* Imprimerie Alsacienne: Strasbourg, 1923.—Present data permit the prediction that lime-sulphur sprays will not give the best results against mildew of the vine, nor, other things being equal, even results comparable to those from cupric mixtures. The great advantage of the lime-sulphur mixtures lies in their low price. Preference, then, will go to the lime-sulphur only when its net cost is much below that of the cupric sprays.—*Frederick V. Rand.*

3718. Chapital, J. **Les avertissements agricoles et la phytopathologie. [Agricultural advice and phytopathology.]** Congrès Path. Vég. Strasbourg *P. 71–74.* Imprimerie Alsacienne: Strasbourg, 1923.—One of the means of most effectively increasing national production consists in organization of a rational defense of the crops against the numerous injuries and diseases which menace them. This is a complex problem which no longer belongs entirely to the province of vegetable pathology. The results of the extension activities described by the author show what may be expected from the intimate and continued collaboration of biologists and meteorologists; this is a form of "symbiosis" still little known and to which the author directs the attention of phytopathologists.—*Frederick V. Rand.*

3719. Chifflot, J[ean]. **Maladies et parasites des boutures de chrysanthèmes. [Diseases and parasites of chrysanthemum cuttings.]** Congrès Path. Vég. Strasbourg *P. 42–44.* Imprimerie Alsacienne: Strasbourg, 1923.—The disease due to *Septoria Chrysanthemi* Cav. is described, and control measures are given. Observations of the past year showed a large number of cuttings attacked by an Oidium; and, also, a large number injured by larvae of *Aphrophora spumaria* L.—*Frederick V. Rand.*

3720. Cotte, J[ules]. **Observations sur une mycose des cochenilles.** Congrès Path. Vég. Strasbourg. *P. 50.* Imprimerie Alsacienne: Strasbourg, 1923.—This paper refers to several months' observations in a garden at Marseilles of cryptogamic infection of cochineal insects which has been made the object of a note by Raybaud [see Bot. Absts. 13, Entry 3731]. The author believes that the sole result of Raybaud's note is to make known a new entomophagous fungus since climatic conditions do not sufficiently favor the growth of this fungus to warrant the hope that it will aid in the practical control of this injurious insect. *Cladosporium Lauri* is worse on *Aonidia Lauri* than on *Lecanium hesperidum*.—*Frederick V. Rand.*

3721. Dustan, Alan G. **The natural control of the green apple bug (*Lygus communis var. novascotiensis Knight*) by a new species of Empusa.** Ann. Rept. Quebec Soc. Protection of Plants **15**: 61–66. 1923.—The Empusa confines itself to the abdomen of the insect, which enlarges and eventually bursts, by which time the infected insects are hidden under loose bark scales on the upper limbs of apple trees. The fungus overwinters as globose resting spores closely adhering to the dorsum of the insect. In spring when the nymphs are emerging the resting spores germinate giving rise to conidia during a period of 40 days near Wolfville, Nova Scotia. Conidia alighting on newly-emerged nymphs germinate, the germ tube entering the insect and developing hyphal bodies in large numbers. Rupture of the dorsum allows the propulsion of another crop of conidia which infect adult insects and in these the resting spores develop.—Artificial spread is by 3 methods: (1) transference of freshly-ruptured insects to another orchard; (2) introduction of diseased insects in late summer so that they constitute sources of inoculum in spring; and (3) placing bark scales with resting spores in the orchard in spring.—*B. T. Dickson.*

3722. Gard, M. **Les bouillies cupriques modifient les propriétés physiques de la surface des feuilles sur lesquelles elles sont appliquées. [Copper sprays modify the physical properties of the leaf surfaces on which they are applied.]** Congrès Path. Vég. Strasbourg *P. 57–60.* Imprimerie Alsacienne: Strasbourg, 1923.—During or after rain the manner in which the upper surface of the leaves is wet differs according to whether or not they are covered by copper

sprays. If sprayed the leaves are wet uniformly and dry quickly, while on unsprayed leaves water in the form of drops remains long enough to permit germination of conidia. These observations were experimentally confirmed by the author.—*Frederick V. Rand.*

3723. Gervais, Prosper. **Quelques réflexions sur la valeur des sels de cuivre employés en viticulture. [Some reflexions upon the value of copper salts employed in viticulture.]** Congrès. Path. Vég. Strasbourg. *P. 62–64.* Imprimerie Alsacienne: Strasbourg, 1923.—The author desires, as a continuation of the communication by Chabrolin [see Bot. Absts. 13, Entry 3717], to present some brief observations, since, from a practical standpoint, the campaign undertaken against the use of copper salts in viticulture constitutes a real peril to these interests.—*Frederick V. Rand.*

3724. Horne, W. T., E. O. Essig, and W. B. Herms. **Plant disease and pest control.** California Agric. Exp. Sta. Circ. 265. *104 p.* 1923.—This circular contains the following information: (a) specific diseases and insect pests of crops arranged alphabetically from alfalfa to walnut, (b) general diseases and pests each affecting more than 1 host, (c) household pests and animal parasites, and (d) formulas.—*A. R. C. Haas.*

3725. Kelsall, Arthur. **Control of orchard pests.** Ann. Rept. Fruit Growers' Assoc. Nova Scotia **1923:** 95–106. 1923.—Insecticide investigations are briefly outlined including tests with standard materials together with new spray and dust developments. Among the latter are sulphur—both as dust and spray—, aluminum sulphate, the new process dusts containing copper and arsenic, nicotine vapor projected by a duster, white arsenic, and calcium caseinate.—*Frederick V. Rand.*

3726. Maas, J. G. J. A. **Herkenning en bestrijding van de voornaamste ziekten en beschadingen van Hevea brasiliensis. [The principal diseases and injuries of Hevea brasiliensis.]** Mededeel Alg. Proefsta. A. V. R. O. S. Rubberser. 28. *12 p.* 1921. [Reprinted from: Arch. Rubbercult. **5:** 55–65. 1921.]—The 1st part of this paper describes the common diseases, pests, and other injuries of the roots, stem, branches, and leaves. The 2nd part deals with control measures for diseases and injuries.—*Cecil Yampolsky.*

3727. Martini, E. **Lehrbuch der medizinischen Entomologie. [Textbook of medical entomology.]** *xvi + 462 p., 244 fig.* Gustav Fischer: Jena, 1923.—This work deals with the relations of arthropods, particularly of insects, to the health of man.—After an introduction, the following general subjects are discussed in detail: nature and taxonomy of arthropods; poisoning by arthropods; arthropods as parasites; arthropods as disseminators of disease; and control of noxious insects.—The discussion under disease dissemination takes up dissemination of arthropods by arthropods; and arthropods as disseminators of worms, sporozoa, amoebae, flagellates, spirochaetes, bacteria, and unknown parasites, probably filterable viruses.—*Frederick V. Rand.*

3728. Novák, Josef. **Mořeni osiva, jeho význam a technické provedení. [Sterilization of seed-grain, its significance and technique.]** Zemědělský Archiv 13, 14. (3–49.) 1923.—Part 1 [No. 13 *(1–32), 11 fig.*] contains a brief account of the history of seed-sterilization, and a report on experiments made in 1920–21 upon several varieties of wheat, barley, rye and oats, with commercial sterilizers (uspulum, asben, etc.), and with hot water, formalin, copper sulphate, corrosive sublimate, and Bordeaux mixture. Immersion methods were chiefly employed, and time and strength of solutions were varied. Both the effect on the spores and on the viability of the seed were observed.—Part 2 [No. 14 *(33–49)*] contains a report on the continuation of these experiments during 1921–22, with the commercial sterilizers uspulum fertilisa, and germisan, as well as with the standard sterilizers previously employed. Both immersion and sprinkling methods were used.—The results are briefly summarized: (1) sterilization of rye with corrosive sublimate proved most satisfactory; (2) results with wheat were most variable, but formalin proved most effective; (3) formalin and then germisan proved most effective with oats; (4) with barley formalin proved to be the best during the 1st year, and germisan during the 2nd. On the whole formalin is most highly recommended for all the grains tested.—A brief bibliography is given.—*B. Shimek.*

3729. Pinckney, R. M. **Action of soap upon lead arsenates.** Jour. Agric. Res. **24:** 87–95. 1923.—Solutions of both sodium-steareate and sodium-oleate soaps dissolve arsenic from lead arsenates, but the former soap dissolves 2–7 times as much as the latter. The arsenic af

diplumbic (or acid) arsenate is much more acted upon than is the triplumbic (or neutral or basic) orthoarsenate. Increasing the concentration of the soaps increases the amount of arsenic dissolved. The action is more complete if the shell of the insoluble end-product is removed around the lead arsenate unacted upon. If soap is to be used with lead arsenates, danger of injury from soluble arsenic can be much reduced by using only the triplumbic arsenate with soap made only from oleic acid.—The amount of arsenic dissolved from the diplumbic arsenate by the stearic soap is too great to confirm the supposition that the action stops with the conversion of diplumbic into basic lead arsenate, and thus supports the supposition that the reaction between soap and lead arsenates is of the double decomposition type.—*Author.*

3730. Rauchbaar, Gustav. **Über das Verhalten keimfreier Abortuskulturfiltrate in vitro und in vivo. [Germ-free culture filtrates of the abortion organism in vitro and in vivo.]** Dissertation. *12 p.* University of Leipzig, 1923.—Bouillon culture filtrates are not suitable as antigen in complement fixation on account of their variability in content of peptone and beef extract. Differences in ability to confer immunity on mice were also observed, due to the variation in toxin content.—*Harry Braun.*

3731. Raybaud, L. **Le Cladosporium Lauri parasite de la cochenille de laurier. [C. Lauri parasitic on cochineal insects of Laurus nobilis.]** Congrès Path. Vég. Strasbourg. *P. 48–49.* Imprimerie Alsacienne: Strasbourg, 1923.—The author refers to the receipt from J. Cotte of leaves of *Laurus nobilis* bearing a Cladosporium which they have named *C. Lauri*. The fungus is found on the lower leaf surfaces in chocolate-colored spots which occurred in connection with the cochineal insects (*Aonidia Lauri* Bouche) and with a few individuals of *Lecanium hesperidum* Forst. This polymorphic fungus is briefly described. [See also Bot. Absts. 13, Entry 3720.]—*Frederick V. Rand.*

3732. Rhoads, Arthur S. **Notes on the failure of grape vines to set fruit and on shelling.** Phytopathology **13**: 513–519. *Pl. 21.* 1923.—The failure of grape vines to set fruit and the shedding or "shelling" of partly matured fruit has been observed in Europe and in America and attributed by horticulturists to physiological causes, principally to lack of fertilization due to self sterility or to unfavorable weather conditions at flowering time. The writer records further observations on this physiological shedding and also reports the failure to set fruit due to attacks of the black-rot fungus (*Guignardia Bidwellii* (Ell.) V. & R.) on the flower clusters. The shedding of mature or nearly mature grapes may also be due to the attacks of such fungi as *Plasmopara viticola, Cryptosphaerella viticola, Melanconium fuligineum, Coniothyrium diplodiella,* and *Glomerella cingulata.*—*B. B. Higgins.*

3733. Roberts, John W. **A method of isolating selected single spores.** Phytopathology **13**: 558–560. *1 fig.* 1923.—An apparatus for the exact manipulation of a capillary tube is described. This apparatus is attached to the substage of the microscope; and, by means of the substage adjusting screw, the capillary tube may be moved to pick up any spore within the field of the microscope.—*B. B. Higgins.*

3734. Seabra, A. F. de. **Note sur l'importance des champignons entomophages dans l'agriculture tropicale. [The importance of entomophagous fungi in tropical agriculture.]** Congrès Path. Vég. Strasbourg. *P. 41–42.* Imprimerie Alsacienne: Strasbourg, 1923.—The use of entomophagous fungi for control of insects merits particular attention in countries where high temperature and humidity specially favor development of cryptogams, as the author has shown in studying diseases and pests of cacao on the Isle of St. Thomas. Several such fungi are mentioned.—*Frederick V. Rand.*

3735. Sharples, A. **Annual report of the mycologist for 1922.** Malayan Agric. Jour. **11**: 267–272. 1923.—Investigations of diseases of the following crops are reported: rubber, coconut and oil palms, roselle fiber (*Hibiscus sabdariffa* var. *altisimma*), arghan fiber, and tobacco. —*R. E. Holttum.*

3736. Shear, Cornelius. **Allocution prononcée par le Dr. Cornelius Shear. [Address by Dr. Cornelius Shear.]** Congrès Path. Vég. Strasbourg. *P. 10–12.* Imprimerie Alsacienne: Strasbourg, 1923.—Greetings are brought from the phytopathologists and botanists of the U. S. A. The author describes briefly the work of the Plant Disease Survey and of the Pathological Collections of the U. S. Dept. of Agriculture, expresses the hopes and plans for development of these institutions in a manner to render the greatest service to all pathologists, and earnestly solicits cooperation of the investigators of all countries. The eventual establishment of a collection of pure cultures of vegetable parasites is planned.—*Frederick V. Rand.*

3737. Shedd, O. M. **An improved method for the determination of nicotine in tobacco and tobacco extracts.** Jour. Agric. Res. 24: 961–970. 1923.—An ether extraction of the nicotine is substituted for the steam distillation common to both the official silicotungsticacid and Kissling methods. The nicotine is then extracted from the ether with acid and the determination completed as in the former method. The improved method is as rapid and as accurate as the silicotungstic-acid method in the analysis of tobacco and tobacco extracts and more satisfactory on tobacco. A direct precipitation method which obviates a preliminary ether extraction or steam distillation to obtain the nicotine has also been tried and fairly satisfactory results were obtained on most of the tobacco extracts employed; it was not, however, applicable to tobacco and a few extracts.—*Author.*

3738. Trzebinski, J[osef], et St. Minkiewicz. **Quelques mots sur l'organization et l'activité de la section de la protection des plantes cultivées et de la section d'entomologie de l'Institut National polonais d'Economie Rurale de Pulawy. [Notes on the organization and activities of the section for protection of cultivated plants and the section of entomology of the Polish National Institute of Rural Economy of Pulawy.]** Congrès Path. Vég. Strasbourg. *P. 34–36.* Imprimerie Alsacienne: Strasbourg, 1923.

3739. Vuillemin, P[aul]. **Pasteur et la pathologie végétale. [Pasteur and plant pathology.]** Congrès Path. Vég. Strasbourg. *P. 15.* Imprimerie Alsacienne: Strasbourg, 1923.—Though Pasteur did not deal directly with plant diseases, he has given such an impulse to all the applications of biology that the main progress of plant pathology shows the imprint of his genius. The author discusses some of the results of his own investigations—including those on bacterial (*B. Vuillemini* Trevisan) tumors of Aleppo pine—as personal evidence of the influence of Pasteur.—*Frederick V. Rand.*

PHARMACOGNOSY AND PHARMACEUTICAL BOTANY

Heber W. Youngken, *Editor*

E. N. Gathercoal, *Assistant Editor*

(See also in this issue Entries 3235, 3258, 3318, 3342, 3350, 3464, 3548, 3555, 3556, 3819, 3844, 3858, 3889, 3946, 3953, 3988, 4057)

3740. Aiyar, S. S. **Phytochemical notes. Balsam of white fir.** Jour. Amer. Pharm. Assoc. 12: 587–588. 1923.—A sample of Balsam of White Fir, presumably that of *Abies concolor* (Gord.) Parry, when distilled with steam yielded 27.7% of an oil, the resin remaining as a brittle amorphous mass when cool. The remainder of the paper deals with the characteristics of the oil and resin.—*Anton Hogstad, Jr.*

3741. Azoulay, Léon. **A propos des séquelles que pourraient laisser les intoxications dues à Entyloma lividum. [The possible after-effects of Entyloma lividum poisoning.]** Compt. Rend. Soc. Biol. 89: 33–34. 1923.—This mushroom is said to cause a kind of poliomyelitis some months after eating, but to date no authentic data supporting this contention have been produced.—*Oran Raber.*

3742. Bacon, F. J., G. C. Jenison, and R. E. Kremers. **Studies in the genus Mentha. Mentha piperita L., as a subject for biochemical research.** Jour. Amer. Pharm. Assoc. 12: 1075–1077. 1923.—The scope of the problem and progress made are briefly outlined. The paper deals with the true definition of the species "*Mentha piperita*;" a hypothesis for the formation of menthol; aldehyde studies, the latter involving the examination of some 12,000 pounds of natural oil, which yielded approximately 500 gm. of isovaleric aldehyde.—*Anton Hogstad, Jr.*

3743. Belschner, H. G. **Forage poisoning.** Agric. Gaz. New South Wales 34: 799–801. 1923.—Wheat sheaves ensiled in a pit silo, when fed to horses in a mouldy condition, produced lethal toxic results. It is presumed that the specific agency was *Bacillus botulinus.*—*L. R. Waldron.*

3744. Bijlsma, U. G., A. A. Hijmans van den Bergh, R. Magnus, J. S. Meulenhoff, en M. J. Roessingh. **De digitalis en hare therapeutische toepassing. [Digitalis and its therapeutic application.]** *111 p., 33 fig.* Rijks Inst. voor Pharmacotherapeutisch Onderzoek: Leiden, 1922. [A German translation of the volume has been issued by Julius Springer, Berlin, 1923.]

3745. Bridel, Marc. **Loganine ou meliatine?** Bull. Soc. Chim. Biol. **5**: 801–805. 1923. —Dunstan and Short, in 1883, isolated a glucoside from the pulp of fruits of *Strychnos Nux-vomica* which they named loganine. L. Rosenhaler (Ueber Loganin. Schweiz. Apoth. Zeit. **61**: No. 31. 1923) has repeated their work, showing that the product which they described was impure. He has succeeded in preparing the glucoside in a pure state, and finds it identical with meliatine, the glucoside isolated by Bridel in 1910 from the rhizomes of *Menyanthes trifoliata* L. Bridel therefore proposes that the name loganine be dropped from the literature.—*Joseph S. Caldwell.*

3746. Briggs, C. H. **A method for the estimation of aloin in Aloes.** Jour. Amer. Pharm. Assoc. **12**: 774. 1923.—In reply to Engelhardt and Crosbie [see Bot. Absts. 13, Entry 3750] that there is no reliable satisfactory method for determining aloin in Aloes, the author presents the method devised by himself, which he states is not ideal but which serves to give a good indication of the amount of aloin in commercial samples of aloes.—*Anton Hogstad, Jr.*

3747. Cuénod, A., L. Guillochon, et P. Luciani. **Les plantes médicinales de Tunisie. [Medicinal plants of Tunis.]** *99 p.* Société Anonyme de l'Imprimerie Rapide de Tunis: Tunis, 1920.—The authors describe respectively the geographical distribution of species occurring in Tunis, the cultivation of medicinal plants, and the methods employed in the collection, drying and preparation of the drugs obtained from these for the market.—*H. W. Youngken.*

3748. Dittmar, Moritz. **The phlobaphenes.** Jour. Amer. Pharm. Assoc. **12**: 680–688. 1923.—Phlobaphenes are secured when tannin-bearing plants are heated or treated with acids. A general account of phlobaphenes as to discovery, characteristics, etc., is followed by a treatment of specific phlobaphenes obtained from the drugs Krameria, Tormentilla, Bistorta, Cinnamon bark, Cinchona, Clove, Kola nuts, and Horse chestnut shells.—*Anton Hogstad, Jr.*

3749. Dujarric de la Rivière, R. **Sur la toxicité d'Amanita citrina. [The toxicity of Amanita citrina.]** Compt. Rend. Soc. Biol. **89**: 132–133. 1923.—The juice when fresh is toxic as shown by rabbit intraperitoneal injections. When the extract is heated at 105°C. for 20 minutes the toxicity is entirely lost. Other investigators have reported this form non-toxic and it is probable that the toxicity varies with the locality, method of extraction, and test animal employed.—*Oran Raber.*

3750. Engelhardt, H., and H. H. Crosbie. **Aloin.** Jour. Amer. Pharm. Assoc. **12**: 695–698. 1923.—According to the authors the only way of determining the amount of aloin in aloes is to work up about 10 pounds of the drug. While under certain conditions the aloin may crystallize out within a few days, under other conditions, especially when unusually large amounts of amorphous substance are present, complete crystallization may require weeks. [See also Bot. Absts. 13, Entry 3746.]—*Anton Hogstad, Jr.*

3751. Garrigues, A. **Les plantes en médécine; les bles. [Medicinal plants; wheats.]** *302 p., 21 illus.* O. Doin: Paris, 1921.

3752. Ghosh, Sudhamoy. **A new method for obtaining water-soluble glucosides from plants in a pure state.** Jour. Amer. Pharm. Assoc. **12**: 1080–1081. 1923.—The author has applied the method to the bark of *Terminalia Arjuna*, the extract of which is widely used as a cardiac tonic by the Ayurvedic physicians of India. Instead of using basic lead subacetate (ordinary method) the author employs a finely powdered mixture of $PbCl_2$ (about 10% of the weight of the dried bark) and PbO (about $\frac{1}{3}$ the weight of $PbCl_2$). The PbO keeps down the acidity of $PbCl_2$ and lessens the chances for hydrolysis of the glucoside. Instead of the presence of acetates as in the general method, NaCl is present, which can be easily eliminated by crystallization from alcohol. The solution on evaporation gives a much purer product than with lead subacetate.—*Anton Hogstad, Jr.*

3753. Hamilton, Herbert C. **The chemistry of Digitalis.** Jour. Amer. Pharm. Assoc. **12**: 494. 1923.—In reviewing the present status of knowledge concerning the chemistry of Digitalis, the author states that up to the present time it has been possible to secure an extract by using 70% of the drug (which is very active) but that further attempts to purify this compound, in order to secure one of absolutely uniform activity, have failed. The difficulty of eliminating one or both of the 2 constituents which have so many points of similarity and the inability to obtain a water-soluble product suitable and convenient for clinical application, are given as the present barriers to progress.—*Anton Hogstad, Jr.*

3754. Hart, Fanchon. **A microscopical comparison of some official herbs and their substitutes.** Jour. Amer. Pharm. Assoc. 12: 489–491. *8 fig.* 1923.—A histological comparison of (1) *Artemisia Absinthium* and substitute species of *Artemisia;* (2) *Arnica montana* and its substitutes.—*Anton Hogstad, Jr.*

3755. Herissey, H., et P. Delauney. **Sur la recherche et la caractérisation de petites quantites de vanilline.** [Investigation and recognition of small quantities of vanillin.] Bull. Soc. Chim. Biol. 5: 748–752. 1923.—The material is distilled with steam in a calcium chloride bath at 130–140°C. As vanillin does not readily distil over, the material is repeatedly brought back to volume by addition of distilled water. If other readily volatilized compounds which react with ferric chloride are present, the first portions of the distillate are rejected. Recognition of vanillin depends upon its conversion by ferric chloride into dehydrodivanillin, which is insoluble in water. The crystals may be recovered by centrifuging and washing and are identified by their form and melting point (302–305°). The test gives positive results with 1 part of vanillin in 10,000 of solution.—*Joseph S. Caldwell.*

3756. Hogstad, Anton, Jr. **A morphological and chemical study of Nicandra Physalodes (L.) Pers.** Jour. Amer. Pharm. Assoc. 12: 576–582. *Fig. 1–18.* 1923.—In this detailed morphological and histological study of Apple of Peru, the author reports also 0.1% of total alkaloids present in dried leaf material.—*Anton Hogstad, Jr.*

3757. Holmes, E. M. **New drugs introduced during the last fifty years.** Jour. Amer. Pharm. Assoc. 12: 712–721. 1923.—The history is recounted of the introduction to the medical profession of Coca, Strophanthus, Jaborandi, Chaulmoogra, and Araroba. Many other interesting facts concerning these drugs are included.—*Anton Hogstad, Jr.*

3758. Johnson, C. W., and Robin Wilkes. **A study of Pacific coast peppermint.** Jour. Amer. Pharm. Assoc. 12: 782–785. *1 fig.* 1923.—The peppermint situation in America is briefly reviewed.—Analyses of 7 samples of 1921 oils produced in Oregon show considerably higher menthyl acetate and total menthol content than eastern oils, 1 containing 78% total menthol, which is twice that of Michigan oils. The average menthol content for Oregon oils is 62%.—*Anton Hogstad, Jr.*

3759. Johnson, S. R. **Castor pomace poisoning.** Jour. Amer. Vet. Med. Assoc. 63: 212–213. 1923.—A brief summary is given of the toxic effects of castor pomace on animals.—*C. D. Marsh.*

3760. Juritz, C. F. **A note on Kaffir melon oil. Further analyses of seeds.** South African Jour. Indust. 6: 67–68. 1923.—The analyses are given of the oils of the seed of 2 varieties of Kaffir melon, tsamma and monketaan. The former has a high iodine value but a very low saponification value, while the latter is near the border line of a drying and semi-drying oil and has an average saponification value. Neither oil contains free acids in objectionable quantities.—*L. J. Goldblatt.*

3761. King, E. D., Jr. **Jimson weed poisoning.** Jour. Amer. Vet. Med. Assoc. 64: 98–99. 1924.—A case of poisoning of a mule by *Datura Stramonium* is described.—*C. D. Marsh.*

3762. Kohn-Abrest, E., et J. Ricardoni. **Nouvelle méthode de dosage de l'acide cyanhydrique des végétaux cyanogénétiques.** [A new method for the quantitative analysis of hydrocyanic acid in cyanogenetic plants.] Compt. Rend. Acad. Sci. Paris 177: 771–773. 1923.

3763. Lynn, E. V., F. A. Lee, and W. H. Clausen. **Chemical examination of Ceanothus velutinus.** Jour. Amer. Pharm. Assoc. 12: 419–420. 1923.—Leaves of *Ceanothus velutinus,* commonly known as Mountain balm, Sticky laurel or Skunk-wood, collected near Silverdale, Washington, yielded 8.18% of petroleum-ether extract. An ether extract of the residue yielded 7.31%. On steam distillation, 0.1% of a dark brown oil was obtained with the following constants: S. G., 1.0157; index of refraction, 1.5315; B. P., 218°C. Approximately 15% of cinnamic aldehyde was obtained. These facts suggest the possibility of using this oil commercially as a flavor or for other pharmaceutical purposes.—*Anton Hogstad, Jr.*

3764. McGill, W. J., and L. R. Wagener. **Electrometric assay methods for crude drugs. II.** Jour. Amer. Pharm. Assoc. 12: 853–855. 1923.—Electrometric assay methods are presented for Nux Vomica and Belladonna. Results are compared with those obtained by the U. S. Pharmacopoeia method. In both instances average higher results were obtained by the electrometric method.—***Anton Hogstad, Jr.***

3765. Maihle, Alphonse. **Preparation de pétrole à partie d'huile végétales et animales. [The preparation of petroleum partly from vegetable and animal fats.]** Compt. Rend. Acad. Sci. Paris 177: 329–331. 1923.

3766. Mayo, Caswell A. **A garden of herbs.** Jour. Amer. Pharm. Assoc. 12: 794–798. 1923.—The author gives lists of medicinal plants in several Ohio counties, including those which are (1) exterminated, (2) rare, (3) locally frequent, (4) still available in commercial quantities. The development of the medicinal plant garden, established at the Wm. S. Merrell Company's plant at Cincinnati, Ohio, is discussed.—*Anton Hogstad, Jr.*

3767. Miller, M. R. **Alkaloidal assays of Delphinium Andersonii Gray.** Jour. Amer. Pharm. Assoc. 12: 492–493. 1923.—*Delphinium andersonii*, 1 of the poisonous larkspurs of the western [U. S. A.] ranges, was assayed and found to contain 1.64–1.90% of alkaloids, calculated as delphinine.—*Anton Hogstad, Jr.*

3768. Newcomb, E. L. **Sources of medicinal plants and seeds.** Jour. Amer. Pharm. Assoc. 12: 583–586. 1923.—The author gives a list of American and foreign medicinal seed and plant dealers, as well as a list of seed materials that can be selected from commercial drug materials.—*Anton Hogstad, Jr.*

3769. Pammel, L. H. **Acorns and large and small ragweed.** Vet. Med. 18: 1137. 1923.—There have been complaints in regard to the injurious character of *Ambrosia artemisiifolia*, but the author does not consider it very injurious. Acorns are injurious, especially those from the querciton oak, the red oak, and northern pine oak.—*C. D. Marsh.*

3770. Pammel, L. H. **Are the seeds of prostrate pigweed poisonous?** Vet. Med. 18: 631. 1923.—The author has no record of poisoning from *Amarantus blitoides*. Common pigweed causes bloat.—*C. D. Marsh.*

3771. Pammel, L. H. **Black nightshade.** Vet. Med. 18: 1137. 1923.—Ripe fruit of *Solanum nigrum* is not poisonous; green fruit is toxic. *S. triflorum* of Colorado and Nebraska is poisonous.—*C. D. Marsh.*

3772. Pamel, L. H. **Butter print and Jimson weed.** Vet. Med. 18: 950. 1923.—Four hogs died after feeding in a pasture containing *Abutilon Theophrasti* and *Datura Stramonium* or *D. tatula*. The author considers the Stramonium as the probable cause of the fatalities.—*C. D. Marsh.*

3773. Pammel, L. H. **Cone flower suspected of poisoning.** Vet. Med. 18: 850. 1923.—It is stated that while *Rudbeckia laciniata* has been suspected, there has been no actual demonstration of its poisonous properties.—*C. D. Marsh.*

3774. Pammel, L. H. **Ensilage suspected of poisoning.** Vet. Med. 18: 364. 1923.—The writer expresses his belief that silage containing *Monascus purpureus* is injurious to stock.—*C. D. Marsh.*

3775. Pammel, L. H. **Ergotism.** Vet. Med. 18: 632–633. 1923.—Symptoms in cattle ascribed to ergotism from June grass are described.—*C. D. Marsh.*

3776. Pammel, L. H. **Is foxtail smut poisonous?** Vet. Med. 18: 1037. 1923.—*Ustilago neglecta* contains a small quantity of ergotin, but not enough to cause abortion. It may cause digestive disorders when eaten alone.—*C. D. Marsh.*

3777. Pammel, L. H. **Is fringed loosestrife (Steironema ciliatum) poisonous?** Vet. Med. 18: 1037. 1923.—It has not been proved poisonous.—*C. D. Marsh.*

3778. Pammel, L. H. **Is morning glory poisonous?** Vet. Med. 18: 1137. 1923.—There is little evidence of poisoning by *Convolvulus arvensis*. If poisonous at all, it is not so to any great extent.—*C. D. Marsh.*

3779. Pammel, L. H. **Is rattle box poisonous to sheep?** Vet. Med. 18: 950–951. 1923.—*Crotalaria sagittalis* has been shown to be poisonous to horses; but sheep, the author thinks, are not ordinarily affected.—*C. D. Marsh.*

3780. Pammel, L. H. **Locoweed.** Vet. Med. 18: 951. 1923.—A plant identified as *Aragallus albiflorus* is not a true loco, but is probably injurious.—*C. D. Marsh.*

3781. Pammel, L. H. **May weed poisoning.** Vet. Med. 18: 850–851. 1923.—In answer to a correspondent who claimed that a cow was made sick by *Anthemis cotula*, the author states that he has never heard of a case of such poisoning.—*C. D. Marsh.*

3782. Pammel, L. H. **Prickly Sida.** Vet. Med. 18: 950. 1923.—A correspondent states that 4 hogs died in a pasture containing *Sida spinosa*.—*C. D. Marsh.*

3783. Pammel, L. H. **Sheep sorrel (Rumex acetosella).** Vet. Med. **18**: 746. 1923.—The author considers that a reported sickness of horses was probably due to the oxalates in sheep sorrel.—*C. D. Marsh.*

3784. Pammel, L. H. **Sticky catchfly suspected of being poisonous.** Vet. Med. **18**: 737. 1923.—*Silene noctiflora* is related to the common corn cockle and, the author intimates, may have similar poisonous properties.—*C. D. Marsh.*

3785. Pammel, L. H. **Three seeded mercury poisonous.** Vet. Med. **18**: 630. 1923.—Symptoms exhibited by animals supposed to have been poisoned by *Acalypha neomexicana* are described.—*C. D. Marsh.*

3786. Pammel, L. H. **Two cases of cowbane poisoning at Walker, Iowa.** Vet. Med. **18**: 633, 1923.—Two boys each ate a piece of root of *Cicuta maculata* about 3 inches long and 1 inch in diameter. Both were very ill, but their lives were saved through stomach evacuation.—*C. D. Marsh.*

3787. Pammel, L. H. **Worm seed or Mexican tea poisonous to geese.** Vet. Med. **18**: 736. 1923.—The plant identified as *Chenopodium ambrosioides* was thought by a correspondent to have poisoned geese. The author confirms its poisonous properties.—*C. D. Marsh.*

3788. Paulman, V. C. **Poisoning from burned, sweet clover hay.** Vet. Med. **18**: 734–736. 1923.—An account is given of the loss of several head of cattle from feeding upon sweet clover hay burned in the stack. The symptoms, which resembled somewhat those of hemorrhagic septicaemia, are described in some detail, and reasons given for ascribing the loss to the sweet clover. A suggestion is made that the intoxication may have resulted from the effect of molds upon the hay.—*C. D. Marsh.*

3789. Peacock, Josiah C., and Bertha L. De G. Peacock. **The tannin of wild cherry bark.** Amer. Jour. Pharm. **95**: 613–623. 1923.—The authors state the astringency of wild cherry bark is due to an "iron greening" tannin, and not to gallic acid, the latter being absent. They noted relatively large quantities of benzoic acid, which no doubt is formed from the oxidation of the benzaldehyde, derived from the amygdalin. The free benzoic acid is doubtless responsible for many of the difficulties encountered with wild cherry preparations, the acid decomposing the cold-water-soluble tannin, with the resultant formation of a cloudiness or a sediment.—*Anton Hogstad, Jr.*

3790. Peacock, Josiah C., and Bertha L. De G. Peacock. **The tannin of wild cherry bark.** Jour. Amer. Pharm. Assoc. **12**: 774–782. 1923. [See preceding entry.]

3791. Pittenger, Paul S. **The standardization of Gelsemium.** Jour. Amer. Pharm. Assoc. **12**: 1063–1067. 1923.—By a comparison of chemical and biological assays as applied to Gelsemium, the author finds that the former method is not applicable to this drug, as it accounts for both the gelsemine (slightly active) and the gelsemiinine (powerful poison), the percentage of alkaloids, thus not indicating the activity of the drug. The biological assay as outlined by the author proved satisfactory and reliable.—*Anton Hogstad, Jr.*

3792. Putt, Earl B., and Harvey A. Seil. **Government standards for spices.** Jour. Amer. Pharm. Assoc. **12**: 1091–1094. 1923.—Standards for spices are compiled as set forth in the United States Pharmacopoeia, National Formulary, and U. S. Dep't. of Agriculture.—*Anton Hogstad, Jr.*

3793. Richaud, A., et Fernand Mercier. **Sur la dose convulsivante et la dose mortelle (par la voie veineuse) de chlorhydrate de cocaïne chez le chien.** [**The minimum dose (intravenous) of cocaine hydrochloride to produce convulsions and death in the dog.**] Compt. Rend. Soc. Biol. **89**: 74–76. 1923.—Due to impurities there has been great variation in the figures previously reported. With the pure alkaloid the minimum dose to produce convulsions is 0.008 gm. per kg., and to produce death 0.012 gm. per kgm. of body weight.—*Oran Raber.*

3794. Rindl, M. **Cane and berry wax.** South African Jour. Indust. **5**: 513–518. 1922.—The white powdery substance on the surface of sugar cane stalks has on account of its hardness and high melting point been regarded as a possible substance for carnauba wax, which commands a high price. The composition of the wax is given and a description of the methods of extraction, refining and bleaching. The extraction, composition, etc., of the wax which occurs in the form of white scales on certain species of *Myrica* are also described.—*L. J. Goldblatt.*

3795. Rosenthaler, L. **Variation in Pflanzenstoffen. [Variation in the chemical characters of plants.]** Mitteil. Naturf. Ges. Bern **1922**: 44–45. 1923. [Abstract.]—The quantity of amygdalin in 100 seed of peach has been determined. It was found to be a regular binomial variation. The distribution was more regular in a series of seed produced of a single tree than in drugs.—*S. Blumer.*

3796. Simonsen, John Lionel. **The constituents of Indian turpentine from Pinus longifolia, Roxb. Part III.** Jour. Chem. Soc. (London) **123**: 2642–2666. 1923.

3797. Smith, A. Bernard. **Poisonous plants of all countries.** *2nd ed., xii + 112 p., 185 fig.* Bailliere, Tindall & Cox: London, 1923.—The author first describes the poisonous plants found in various parts of the world, giving in each instance the family, synonyms, diagnostic characteristics, and toxic principles. The plants are classified under the following captions: (1) poisons acting on the brain (narcotics, deliriants, inebriants); (2) poisons acting on the spinal cord (convulsives); (3) poisons acting on the heart (depressants, asthenics); (4) irritant poisons (purgatives, irritants with nerve-symptoms, simple irritants); and (5) specific irritants (microfungi and bacteria). The appendix contains a list of plants reputed to be poisonous, together with their synonyms and toxic principles. A list of plants causing Dermatitis venenata is also given as well as a 2 page glossary.—*H. W. Youngken.*

3798. Stanford, E. E. **Pharmacognosy in the garden.** Jour. Amer. Pharm. Assoc. **12**: 412–416. *1 fig.* 1923.—A brief outline is given of the development of the medicinal plant garden at the Western Reserve University School of Pharmacy.—*Anton Hogstad, Jr.*

3799. Stanford, E. E., and E. D. Davy. **Alkaloidal content of Daturas affected by mosaic injury.** Science **58**: 450–451. 1923.—An increase of from about 100% to 400% is reported.—*C. J. Lyon.*

3800. Stoneback, W. J., and R. Calvert. **Histology and chemistry of the avocado.** Amer. Jour. Pharm. **95**: 598–612. *12 fig.* 1923.—Avocado fruit is derived from *Persea gratissima* Gaertn. and *P. drymifolia* (Cham. & Schlecht.). The fruit is shown by the authors to be high in fat (20%) and caloric value. One pound of the edible portion represents an average of 1,000 calories. The photographs and drawings fully illustrate the morphological and histological characteristics of the fruit. Various analyses by the authors and other workers are given which include the moisture, protein, fat, carbohydrate and ash contents.—*Anton Hogstad, Jr.*

3801. Youngken, H. W. **Studies of the bark of Myrica cerifera, Linne.** Jour. Amer. Pharm. Assoc. **12**: 484–488. *3 fig.* 1923.—Myrica, as recognized by the National Formulary IV, is given as "the dried bark of the root of *Myrica cerifera* L. (Fam. Myricaceae) without the presence of more than 5% of adhering wood." This definition, as recommended by the author, should be changed to include not only the bark of the root, but the bark of the rhizome and aerial portions as well, provided that quantitative determinations of the tannin in the 3 barks confirm his microscopic findings. He also suggests that the synonym "Bayberry" should be changed to "Wax Myrtle" or "Wax Myrtle bark," since the true bayberry is now generally accepted by systematists to be *M. carolinensis* and not *M. cerifera.* Macroscopical and microscopical characteristics of the 3 barks are presented, as well as the histological features of the powdered bark. A bibliography is appended.—*Anton Hogstad, Jr.*

PHYSIOLOGY

B. M. Duggar, *Editor*

W. J. Robbins, *Assistant Editor*

(See also in this issue Entries 3317, 3320, 3324, 3326, 3330, 3331, 3336, 3337, 3338, 3346, 3347, 3348, 3349, 3350, 3351, 3355, 3357, 3361, 3362, 3414, 3421, 3547, 3550, 3552, 3553, 3585, 3621, 3627, 3637, 3639, 3640, 3641, 3668, 3670, 3674, 3675, 3692, 3709, 3762, 3795, 3799, 3978, 3980, 3985, 3987)

GENERAL

3802. Dixon, H. H. **The nerves of plants.** Nature **112**: 799–800. 1923.—This is a summary of a lecture before the Royal Dublin Society and reviews the work of Ricca, Boyce-Jensen and others.—*O. A. Stevens.*

PROTOPLASM, MOTILITY

3803. Bose, J. C. **Life movements in plants.** Trans. Bose Res. Inst. **3, 4:** 599–902. 1920, 1921.—The 2 volumes cite 111 experiments concerning "investigations on geotropism, on dia-heliotropic attitude of leaves as regulated by transmitted nervous impulse, on assimilatory and dissimilatory changes under light, on new methods of recording the effects of protoplasmic change under stimulus; and also of various methods and appliances for detection of the 2 fundamental reactions to which all plant movements are due. * * * Electric investigations have been described which lend strong support to the theory of statoliths, indeed practically confirm it. * * * The Electric Probe has made it possible to explore the interior of the plant, and map out the excitatory changes from layer to layer under the stimulus of gravity. The nervous tissues which conducts excitation has been localized in the phloem of the fibro-vascular bundle."—A critical angle of the stem and petiole for immediate geotropic excitation is reported. Plant responses to mechanical, electric, and photic stimulation are recorded by the method of variation of the electric resistance. The author has invented an automatic radiograph to give a continuous record of the variations of light and a vegetable photo-electric cell is also described. Some effects of anaesthetics on growth and geotropic response are given. —A general review of volumes 1–4 is given in which the author discusses the generalizations which he believes have been experimentally established from the 340 experiments cited in these volumes.—*Geo. M. Armstrong.*

DIFFUSION, PERMEABILITY, PHYSICO-CHEMICAL PHENOMENA

3804. Beutner, R. **Diphasic liquid systems and bio-electrical phenomena. A reply to criticism.** Ann. Botany **37:** 673–678. 1923.—The author states that J. S. MacDonald originally pointed out (Proc. Roy. Soc. London **67:** 310) the existence of a regular relation between the electric current of tissue (excised frog's nerve) and its salt content. The attempt by Haynes [see Bot. Absts. 13, Entry 3806] to explain the results secured by Beutner in imitating MacDonald's results with artificial systems as due to changes in H-ion concentration is shown to fail.—*W. J. Robbins.*

3805. Collin, R. **Action d'un mélange colorant sur un hydrogel. [Action of a color mixture on a hydrogel.]** Compt. Rend. Soc. Biol. **89:** 562–563. 1923.—Experiments are described with Mann's solution (a mixture of methyl blue and eosin) and gelatin. The eosin diffuses into gelatin much more rapidly than the methyl blue. The determining factors are the physical nature of the diffusing liquid and the concentration of the gel.—*Oran Raber.*

3806. Haynes, Dorothy. **Diphasic liquid systems and bio-electrical phenomena.** Ann. Botany **37:** 679–683. 1923.—Beutner's systems are criticized because they are not in equilibrium. Miss Haynes admits that changes in H-ion concentration can not account for the whole difference in potential observed in a diphasic liquid system such as Beutner used but considers that such changes in pH as probably arise invalidate the quantitative results secured by Beutner. [See also Bot. Absts. 13, Entry 3804.]—*W. J. Robbins.*

3807. Kahho, Hugo. **Ein Beitrag zur Permeabilität des Pflanzenplasmas für die Neutralsalze. IV. [A contribution on the permeability of the plasma membrane of plants to neutral salts. IV.]** Biochem. Zeitschr. **123:** 284–303. 1921.—This is a continuation of previous studies and supports the theses that all factors which increase the permeability of the cell to neutral salts also increase the toxicity, and the reverse; that the precipitating power of a salt varies inversely with its penetrating power; and that the cation and anion have different effects upon permeability so that the action of a neutral salt may be considered as the additive effect of 2 terms (the anion and cation) of different algebraic signs.—*Oran Raber.*

3808. MacDougal, D. T. **Permeability and the increase of volume of contents of living and of artificial cells.** Proc. Amer. Phil. Soc. **62:** 1–25. 1923.—The artificial cells used were constructed with walls of cellulose-holding pentosans including pectins, and with an inner deposit of albumins and lipins and a retaining layer of pentosans. The amount of water absorbed by such cells was found to be proportional to the osmotic value of the cell contents, which were solutions of sugar. The relative amounts absorbed when cells were immersed in salt solutions were found to correspond to the specific action of the ions of the salts on the col-

loids of the cell. The ions of the salt solutions which penetrated the walls of the cell affected permeability of such colloids as pentosans in a degree corresponding to their diffusion velocities and in accordance with the Hardy-Schulze law. Some of the bases formed compounds with lipins, pectins, and albumins which affected permeability. The rate of endosomosis increased as permeability was lessened, K, Na, and Ca lessening permeability in the order named. Conductivity tests indicated that cells with an albuminous component showed the greatest absorption of ions from a Ca-salt solution and the least from a Na-salt solution, with the rate in a K solution intermediate. Conductivity tests of cell contents showed the abundance of the above named bases in a decreasing series to be K, Ca, and Na in the albuminous cell. The expansion coefficients of sections of living *Opuntia* in salt solution included osmotic effects and those of chemical combination so that the decreasing series was Ca, K, Na, the greatest expansion being in cells with the least permeable walls and therefore the highest turgidity.—*Wanda Weniger.*

3809. Markoff, J. **Sur la décoloration des extraits éthérés. [The decolorization of ether extracts.]** Compt. Rend. Soc. Biol. **89**: 113–115. 1923.—Since ether extracts of material such as fecal matter, blood, and other animal products are frequently colored by various pigments which hinder accurate analysis it is important to decolorize without hindering the analysis. Such a method is described by the use of phosphotungstic acid and its derivatives.—*Oran Raber.*

3810. Mercanton, Paul-Louis. **Capillarité et imperméabilité conditionelle des étoffes. [Capillarity and conditional impermeability of materials.]** La Nature **1923**: 389–390. *1 fig.* 1923.

3811. Pozerski, E. **Sur l'excrétion de composés phosphorés par les microbes. Action du formol à faibles doses. [The excretion of phosphorus compounds by microörganisms. The action of formalin in weak doses.]** Compt. Rend. Soc. Biol. **89**: 27–28. 1923.—A solution of 0.025% formalin added to a culture of the Shiga bacillus quickly stops the reproduction of the organism, which, however, continues to excrete phosphorus compounds for at least 4 days. The excretion is stopped by a 1% solution of formalin.—*Oran Raber.*

3812. Smith, E. Philip. **Effects of anaesthetics on plants.** Nature **112**: 654. 1923.—The alteration of permeability of cells to ions of salts can be demonstrated conveniently with the corolla of *Ipomea Learii*. If discs of the corolla are first treated with aqueous solutions of chloroform (0.04–0.1 M) or ether and then with a saturated solution of CO_2 a time curve can be constructed extending over 40–50 minutes. It is concluded that the anaesthetic alters the permeability by action upon the protoplasm and not upon the cell wall. A correction may be necessary in such experiments due to the effect of the anaesthetic upon the apparent rate of respiration.—*O. A. Stevens.*

3813. Sokoloff, Boris. **Neutralisation des ions. [The neutralisation of ions.]** Compt. Rend. Soc. Biol. **89**: 622–624. 1923.—Experiments are cited to show that *Paramecium* and other protozoa live longer in mixtures of $CaCl_2$ and NaCl or in mixtures of $CaCl_2$ and $FeCl_3$ than in the sodium and iron chlorides alone.—*Dileptus* and *Bursaria* are sensitive to H and OH ions. They live best in a medium of pH 7.7. Above pH 8.0 or below 6.2 their vitality is much diminished.—*Oran Raber.*

3814. Ursprung, A. **Zur Kenntnis der Saugkraft VII. [A contribution to the knowledge of absorptive power.]** Ber. Deutsch. Bot. Ges. **41**: 338–342. 1923.—The author gives a new method for the measurement of absorptive power. Only the average from a tissue (not a single cell) is obtainable. The advantage of the new method is that it saves time and can be used in the field. A strip (5 cm. long) of tissue is placed on a slide which is marked off in $\frac{1}{2}$ mm. By help of an ocular micrometer the entire length can be observed. In the field only the marked off slide and a lens with magnification of 16 × are necessary.—*Hally Jolivette Sax.*

WATER RELATIONS

3815. Coupin, Henri. **Le gonflement des graines et la pression osmotique du milieu. [The swelling of seeds and the osmotic pressure of the medium.]** Compt. Rend. Acad. Sci. Paris **177**: 971–973. 1923.—The swelling of various leguminous seeds was determined in sugar

solutions. Soybean swells in 40–65% sucrose, the swelling slackens at 68%, and ceases at 70%. Seville beans, Michaux peas, and dwarf white kidney beans swell at concentrations between 40 and 60%, slacken at 65%, and cease at 70%. White lupine swells at 40–50%, slackens at 60%, and ceases at 70%. The osmotic pressure in atmospheres of Seville beans is 44; Michaux peas, 41; kidney beans, 41; lupine, 39. Wheat with an osmotic pressure of 30 atmospheres ceases swelling at 45% sucrose; and dent field corn with an osmotic pressure of 20 atmospheres does not swell in 30% sucrose solution.—*C. H. Farr.*

3816. Fritch, F. E., and F. M. Haines. **The moisture relations of terrestrial algae. II. The changes during exposure to drought and treatment with hypertonic solutions.** Ann. Botany **37**: 683–728. *8 fig.* 1923.—There are great differences among the cells of individual algae in their behavior to a given strength of sea-salt solution, some becoming strongly plasmolyzed, others only slightly, and still others remaining unaffected. Very high concentrations are often necessary to plasmolyze many of the cells, *Pleurococcus* for example requiring 25% solutions to plasmolyze 80% of the cells. The unaffected cells are almost invariably rich in the characteristic granules of terrestrial algae, while the plasmolyzed ones usually lack them. During drought there is a progressive decrease in the number of plasmolyzed cells and in the degree of plasmolysis. When patches of soil with filamentous forms are placed in various concentrations of sea salt in open dishes a considerable number of cells recover from plasmolysis, but most of these die in a week; the rest, though slightly plasmolyzed, remain a healthy green. Along with the plasmolyzed cells are others with healthy, quite uncontracted protoplasts.—The cells show marked differences among themselves in degree of permeability to certain stains. In some species the permeability runs parallel with the behavior towards sea-salt solutions, the unaffected cells staining immediately while the plasmolyzed ones remain unstained for a long time. During drought there is usually a marked increase in permeability in the final condition, the only unstained cells being the few healthy ones.—In drought material 3 kinds of cells can be distinguished: (a) dead, (b) slightly plasmolyzed and with coarse granules, (c) healthy and with numerous fine granules and a rigid, highly viscous protoplast. In fresh material the cells are in diverse states as regards drought resistance. There are usually a number of healthy cells not plasmolyzed by high concentrations, impermeable to stains, and containing numerous fine granules. They are the basis for new growth when conditions become favorable following a drought which has killed the other cells. The features distinctive of drought material in general are exhibited by fresh material of some forms such as *Pleurococcus*. The retention of water is not due to a high osmotic concentration of the sap but possibly to the gel-condition of the protoplast.—*W. P. Thompson.*

3817. Lubimenko, V., et Mme. S. Fichtenholz. **Contribution a l'étude du rôle physiologique de la nervation des feuilles. [A contribution to the study of the physiological role of the venation of leaves.]** Compt. Rend. Acad. Sci. Paris **177**: 833–835. 1923.—The main veins of leaves of trees and shrubs were slashed at the base of the blade during the hottest and driest periods of summer. If the blade elongated below the cut, a new cut was made at the new base subsequently. The plants used were *Acer platanoides, Aesculus Hippocastanum, Cornus Mas, Philadelphus coronarius, Rubus Idaeus, Rubus odoratus, Salix Caprea, Sambucus racemosa, Syringa vulgaris, Tilia parvifolia, Ulmus effusa,* and *Polygonum Sacchalinense.* All leaves cut lost their normal orientation. In many cases the wind tore off the leaves, though many leaves remained attached for 3–8 weeks without loss of turgescence or normal appearance other than orientation. Anatomical examination showed that the total conductive tracts were much reduced by the cutting. In *Acer* the transverse section of the conductive tubes was reduced to $\frac{1}{12}$; in *Aesculus* to $\frac{1}{16}$; and in *Salix* to $\frac{1}{44}$. In the autumn, operated leaves yellow at the same time as the normal, except in *Polygonum* which showed precocious yellowing. In *Rubus odoratus* there was a slackening in growth of the blade, but in *Acer* growth continued normally. Potted herbaceous plants were treated in much the same way. Some had all of their leaves slashed at the base of the blade; in other plants this was done only with alternate leaves; a third lot was kept as controls. After 3 months some of the plants bloomed, and were then used for determining the effect on dry weight. *Lychnis calcedonia* showed no effect of the slashing on dry weight; *Plantago lanceolata* showed more effect when alternate leaves were operated upon. *Campanula ranunculoides* showed an effect of the slashing only when all leaves were

cut. *Silene noctiflora* showed more effect when all were cut than when only alternate leaves were treated. *Hordeum vulgare* behaved like *Plantago*. *Avena sativa* showed equal reduction in dry weight with cutting all or alternate leaves. In all except *Campanula* the leaves attained the normal size. It is concluded that the principal function of veins in the leaf is to give mechanical support. The function second in importance is the transfer of food formed in the blade. Their value for water transport ranks last.—*C. H. Farr.*

3818. Richter-Quittner, M. **Die Bedeutung der Quellung und Entquellung für einige Fragen der Biochemie. [The significance of water absorption and withdrawal for some problems of biochemistry.]** Biochem. Zeitschr. **121**: 273–292. 1921.—The rate of filtration through the Zsigmondy-Haensch ultrafiltration apparatus was determined for ox serum, human blood, and ascitic fluid after the addition of various electrolytes and non-electrolytes which are known from the work of Hofmeister, Pauli and Fischer to affect the water relations of colloids. Non-electrolytes as sugar and urea, with salts of K and the heavy metals, accelerate the filtration in all cases; all other electrolytes and especially alkalies and acids decrease the rate of filtration. The influence of the cation is more marked than that of the anion, and the anions stand in the order established by Hofmeister for their effect upon absorption of water by gelatin.—*Joseph S. Caldwell.*

3819. Shull, C. A. **Physiology of the ascent of sap.** [Rev. of: Bose, J. C. **The physiology of the ascent of sap.** *xv* + *277 p.* Longmans Green & Co.: New York and London. 1923 (see Bot. Absts. 12, Entry 5176).] Bot. Gaz. **76**: 316–317. 1923.—The reviewer criticizes the author's failure to include in his historical summary the work done on the ascent of sap problem during the last 20 years, and holds that no real proof has been brought forward to support the author's pulsation theory. The modern theory of xylem conduction under evaporation tension still holds.—*B. W. Wells.*

MINERAL NUTRIENTS AND SALT RELATIONS

3820. Blaringhem, L. **Contrôle biologique de l'influence des engrais; détermination des périodes sensibles. [The biologic control of the effect of fertilizers; the determination of sensitive periods.]** Compt. Rend. Acad. Sci. Paris **177**: 407–409. 1923.—Poor soil is placed in pots and mineral fertilizer is added to all except controls. Barley, flax, and poppy were studied. In addition to 3 controls, data are given on cultures high in the following minerals respectively: N, K, P, Ca, NK, NP, NCa, KP, PCa, KCa, KPCa, NKP, NKCa, and NKPCa. In barley, readings are given for density of heads, and ratio of length of 1st internode to height. In flax, readings are given on height and density of foliage. In the poppy, readings are given on the number of capsules classified according to number of stigmas. It is concluded that mineral salts do affect some characters more at certain periods than at others. The necessity of using pure line stock for physiological comparisons is emphasized.—*C. H. Farr.*

3821. Fontes, G., et L. Thivolle. **La molybdo-manganimetrie et ses applications. Deuxieme partie (suite). Microdosage du fer dans les tissus. [Molybdomanganimetry and its applications. Part 2. Micro-measurement of iron in tissues.]** Bull. Soc. Chim. Biol. **5**: 782–793. 1923.—The authors describe their method for preparing a sample of tissue for determination of its iron content by precipitation as ferro-nitroso-betanaphthol. [See also Bot. Absts. 13, Entries 2969, 2970.]—*Joseph S. Caldwell.*

3822. Frouin, Albert, et Maylis Guillaumie. **Nutrition minérale du Bacille tuberculeux. Action favorisante ou empêchante des sels de terres rares et des sels de fer. [The mineral nutrition of B. tuberculosis: the favoring or hindering action of salts of the rare earths and of iron.]** Compt. Rend. Soc. Biol. **89**: 382–383. 1923.—It has been previously shown that salts of P, S, K, and Mg are necessary to the development of *B. tuberculosis*. The rare earths increase the growth in a synthetic medium with glycerin and sugar if it is neutral or nearly so (pH 6.2–7) while in acid media (pH 5.2–5.6) the growth is hindered by the rare earth salts. In media without glycerin the action of the rare earth salts varies with the concentration of the sugar and the reaction of the medium. With 5 gm. per l. of glucose, yttrium salts increase the growth at pH 5.8 and diminish it at pH 7.0. If the medium contains 20 gm. per l. of glucose, the addition of yttrium decreases the growth whatever may be the reaction of the medium.—In a glycerin-glucose medium iron salts increase the growth regardless of the reaction. With-

out glycerin but with glucose, growth is increased by iron salts in acid media (pH 5.6) and diminished in neutral media (pH 7.2).—*Oran Raber.*

3823. McHargue, J. S. **The role of manganese in plants.** Jour. Amer. Chem. Soc. **44:** 1592–1598. 1922.—The plants used grew normally for the first 6–8 weeks without Mn in the culture solution due to a small supply stored in the seeds. The first effect of the lack of manganese is the absence of chlorophyll development in the new tissues. Leguminous plants seem to be more sensitive to the lack of manganese than the non-leguminous plants. Manganese seems to be a necessary catalyst in plant metabolism. Manganese and iron function in the development of chlorophyll.—*J. M. Brannon.*

3824. Policard, A. **Recherches histochimiques sur la rapidité de minéralisation et la teneur en cendres des diverses parties des cellules.** [**Histo-chemical researches on the rapidity of mineralisation and the ash content of various parts of cells.**] Compt. Rend. Soc. Biol. **89:** 533–535. 1923.—When the incineration of *Spirogyra* is complete the filament appears as a tube of white ashes with cross walls. The cell sap has a small ash content. The walls are rich in ash but less so than the chloroplast, which has a high ash content because of the magnesium present. In the chloroplast of a filament carefully incinerated it is even possible to see small holes, which probably represent the pyrenoids of smaller ash content.—*Oran Raber.*

3825. Warington, Katherine. **The effect of boric acid and borax on the broad bean and certain other plants.** Ann. Botany **37:** 629–672. *Pl. 13, 6 fig.* 1923.—The effect of boric acid on the broad bean and barley in water cultures, pot cultures and field experiments was studied. Experiments were also performed with the following plants in water cultures: *Phaseolus multiflorus, P. vulgaris, Trifolium incarnatum, T. repens, Pisum sativum,* winter vetch, and rye. For broad bean in water culture a continual supply of boric acid is essential to healthy growth. Beneficial results were obtained by using concentrations varying between 1:12,500,000 and 1:25,000 H_3BO_3. Death occurs in the absence of boron. Excess of boric acid (1:5,000 or more) is injurious to the broad bean plant. Barley plants remain healthy and make optimum growth in the absence of any boron compound. Boric acid is more poisonous to barley plants than to broad bean plants, a concentration of 1:2,500,000 H_3BO_3 being injurious to the former. Tests with pot cultures and in the field substantiated the results of those with water cultures. The results with the other plants listed were rather inconclusive, but some, especially *Phaseolus multiflorus* and *Trifolium incarnatum,* seem to derive benefit from the prosence of boric acid in culture solutions. In the concentrations used (1:2,500,000 and 1:100,000) boric acid had no effect on the growth of winter vetch and rye. The author regards the effect of boron on the broad bean as probably nutritive rather than catalytic.—*W. E. Maneval.*

3826. Wester, D. H. **Über den Mangangehalt von (Holländischen) Samen.** [**The manganese content of (Dutch) seeds.**] Biochem. Zeitschr. **118:** 158–163. 1921.—In seeds from 13 families, manganese was found in every case. The majority of seeds contain 2–6 mgm. of Mn for every 100 gm. of dry material.—*Oran Raber.*

PHOTOSYNTHESIS

3827. Duval, Marcel, et P. Dumaraud. **Rapidité du changement de réaction des eaux de ruissellement.** [**The rapidity of the change of the reaction of water in running brooks.**] Compt. Rend. Soc. Biol. **89:** 398–400. *1 fig.* 1923.—Little change is seen between the pH at night and during the day. After leaving the source the water becomes slightly more alkaline (pH 7.1–7.6) due to the liberation of CO_2 dissolved in the underground waters. Vegetation in the brook beds does not influence the reaction appreciably through photosynthesis or respiration because of the relatively small proportion to total water volume, but it aids in freeing the CO_2 through agitation.—*Oran Raber.*

3828. Fromageot, C. **Influence de la concentration en sels de l'eau de mer sur l'assimilation des algues vertes.** [**The influence of the concentration of the salts of sea water on the assimilation of green algae.**] Compt. Rend. Acad. Sci. Paris **177:** 779–780. 1923.—A study is made of the intensity of photosynthesis of *Ulva lactuca.* A little Seltzer water is added to sea water rendering it slightly acid. It is then brought back to the pH of normal sea water by adding a few drops of 0.1 *N* NaOH. Winkler's method of quantitative analysis of O_2 libera-

tion was employed. The tables give the oxygen liberation per hour at concentrations from $\Delta = 0.03$ to $\Delta = 4.20$. Up to $\Delta = 1.94$ the intensity of photosynthesis varies as the concentration. Above $\Delta = 1.94$ the intensity slowly decreases. It thus appears that there is an optimum osmotic pressure for photosynthesis.—*C. H. Farr.*

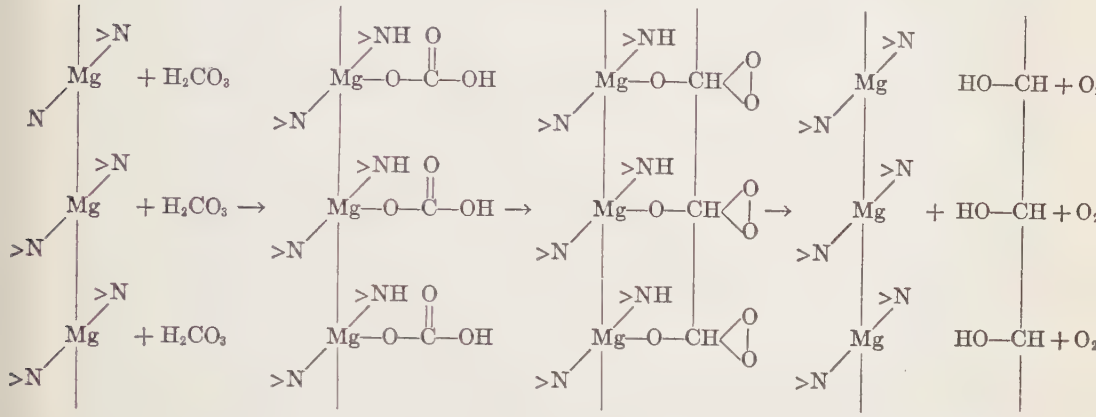
3829. Fromageot, C. **L'assimilation chez les cellules vertes et la structure du protoplasma. [The assimilation of green cells and the structure of protoplasm.]** Compt. Rend. Acad. Sci. Paris **177**: 892–894. 1923.—*Ulva* is grown in water and in different concentrations of glycerin and the effect noted on the liberation of O_2 during photosynthesis and the absorption of O_2 in respiration. It is found that O_2 liberation falls in an average of 4 experiments from 3.8 cc. per hour in water to 0.45 cc. in 30% glycerin. A slight absorption of O_2, from 0.17 to 0.36 cc. per hour, occurs between 40 and 100% glycerin concentrations. In respiration 2.12 cc. of O_2 is absorbed per hour in water; 2.94 cc. in 10% and 3.24 cc. in 20% glycerin. Above this it falls to 9.89 cc. in 50% and remains slightly more than 1.0 between 60% and 100% glycerin. This result is comparable to the effect which Wurmser and Jacquot secured with the effect of temperature. Photosynthesis seems to be more responsive than respiration. It is further found that *Ulva* in 45% glycerin in light absorbs twice as much O_2 as in the dark, indicating a photo-oxidation.—*C. H. Farr.*

3830. Kostytschew, S. **Die Photosynthese der Insektivoren. [The photosynthesis of insectivorous plants.]** Ber. Deutsch. Bot. Ges. **41**: 275–280. 1923.—To test the theory that insectivorous plants absorb N free materials and mineral salts accompanied by weak photosynthetic power, the author measured the CO_2 assimilation of *Drosera rotundifolia* and *Pinguicula vulgaris*. These species have as great CO_2 assimilation as the control plants and it is concluded that N-free material is supplied in sufficient quantity by photosynthesis.—*Karl Sax.*

3831. Lubimenko, V. **Action spécifique des rayons lumineux de diverses couleurs dans la photosynthèse. [The specific effect of light rays of different colors on photosynthesis.]** Compt. Rend. Acad. Sci. Paris **177**: 606–608. 1923.—Monochromatic light with red rays from 760 to 600 $\mu\mu$ and blue rays from 480 to 400 $\mu\mu$ was used. The intensity of the blue rays of sunlight is assumed to be 85% of the red. Experiments were carried on at a constant temperature of 20°C. for 6 hours with a clear sky. A table shows the CO_2 in cc. decomposed per gm. of living leaf per hour. Photosynthesis in all of the 8 species used was greater in red than in blue light, double in some cases. The intensity of photosynthesis was retarded with time in both red and blue light. It was only in species adapted to diffuse light of low intensity, as *Hedera helix* and *Aspidistra elatior*, that the activity with blue rays equals or exceeds that with red rays. A 2nd table shows the intensity of photosynthesis at successive 2-hour intervals in terms of the ratio of results from blue-light and red-light experiments.—*C. H. Farr*

3832. Maquenne, L. **Sur la théorie de la synthèse chlorophyllienne. [Concerning the theory of photosynthesis.]** Compt. Rend. Acad. Sci. Paris **177**: 853–856. 1923.—Of all the theories of the chemistry of photosynthesis that of Boussingault-Baeyer seems to be most strongly supported, namely: $CO_2 + H_2O \rightarrow$ carbonic acid $\rightarrow$ formaldehyde $\rightarrow$ carbohydrate. It is usually considered that the change from carbonic acid to formaldehyde is by the action of chlorophyll, and that the change from formaldehyde to carbohydrate is a condensation of a chemical or enzymatic nature. The artificial synthesis of formaldehyde into reducing sugars is not entirely conclusive, inasmuch as other aldehydes may also be used. Likewise the use of formaldehyde by green plants is open to the same objection. Some claim that chlorophyll acts only as an optical sensitizer, and plays no chemical role, while others claim that formaldehyde is a decomposition product of chlorophyll. It may, however, be that there is no formaldehyde or other distinct intermediate product produced between carbonic acid and carbohydrates. The existence of such an intermediate substance presupposes that polymerization follows the decomposition of CO_2. It may, however, be that it precedes or accompanies decomposition of CO_2. Colloidal chlorophyll is found by Willstätter to be insoluble in organic solvents, its spectrum is considerably more red, and in excess of CO_2 it decomposes. This colloidal chlorophyll may be a simple hydrate of the molecular chlorophyll, but it seems also reasonable to assume that there are 2 forms easily transferable one into the other, and that chlorophyll micellae are produced by the polymerization of the primitive pigment, the molecules

uniting by supplementary valences of either Mg or N. It follows that the carbonic acid may form a loose compound with colloidal chlorophyll becoming attached to the Mg atoms, which lie in an open chain. The C atoms of the carbonic radicles then form an open chain parallel with that of the Mg atoms. Then the chain of C atoms breaks from the colloidal chlorophyll and losing 2 O atoms from each radicle gives carbohydrate directly, thus:



—*C. H. Farr.*

METABOLISM (GENERAL)

3833. Anonymous. **Richness and colour in milk.** Jour. Dept. Agric. Victoria 21: 223. 1923.—The carotin of plants is said to produce the natural yellow color of milk, cream and butter. The value of various plants for this purpose is given.—*Wm. E. Lawrence.*

3834. Beckmann, Ernst, und Otto Liesche. **Physikalisch-chemische Charakterisierung des Lignins aus Winterroggenstroh.** [**Physico-chemical characteristics of the lignin of winter-rye straw.**] Biochem. Zeitsch. 221: 293–310. 1921.—Determinations of the molecular weight of lignin from rye straw in phenol and glacial acetic acid gave a value of 764.6. The valence as determined upon sodium lignate is 2. The electrical conductivity of an aqueous sodium lignate solution was determined.—*Joseph S. Caldwell.*

3835. Bertrand, Gabriel, et Atherton Seidell. **Sur la séparation de la vitamine antineuritique de la levure à l'état de picrate.** [**The isolation of the antineuritic vitamin of yeast as picrate.**] Bull. Soc. Chim. Biol. 5: 794–796. 1923.—Sufficient H_2SO_4 to combine exactly with the bases present is added to a crude vitamin extract, it is distilled almost to dryness, alcohol is added, and the liquid filtered. Picric acid dissolved in methyl alcohol is added and the alcohol partially distilled off under reduced pressure, after which the crystals are collected by centrifuging and washing. Two sorts of crystals, a needle-form melting at 202°, and irregular particles melting at 160° are present in the mixture. The latter is much more active than the former. Two mgm. of the mixture per day protects a pigeon on a diet of polished rice against neuritis. The picrate has all the potency of the crude extract from which it has been prepared.—*Joseph S. Caldwell.*

3836. Boquet, A., et L. Nègre. **Sur les propriétées biologiques des lipoides du Bacille de Koch.** [**The biological properties of Koch's Bacillus.**] Compt. Rend. Soc. Biol. 89: 138–140. 1923.—The lipoids extracted from Koch's bacillus, especially the phosphatids, behave as antigens.—*Oran Raber.*

3837. Boresch, Karl. **Die wasserlöslichen Farbstoffe der Schizophyceen.** [**The water-soluble pigments of the Schizophyceae.**] Biochem. Zeitschr. 119: 167–214. *34 fig.* 1921.—The water-soluble pigment from a large number of Schizophyceae, grown in pure culture, was studied spectroscopically. The species studied fall into 3 groups, containing (1) only phycocyanin, (2) both phycocyanin and a red pigment which fluoresces orange-yellow and

which contains only 1 absorption band (in the green between the Frauenhofer lines D and E). This pigment is called "Schizophycean phycoerythrin" and differs from the phycoerythrin of the red algae as shown by capillary analysis. Group (3) contains no or almost no phycocyanin but only the phycoerythrin (*Porphyridium cruentum*). Nowhere among the Schizophyceae was ordinary phycoerythrin found.—*Oran Raber.*

3838. Bridel, Marc. **Etude biochimique sur la composition du Monotropa hypopitys: obtention d'un nouveau glucoside, la monotropeine. [Biochemical study of Monotropa hypopitys; isolation of a new glucoside, monotropeine.]** Bull. Soc. Chim. Biol. 5: 722–730. 1923.—Successive digestion of the aqueous extract of the plant with invertase and emulsin showed the presence of a glucoside hydrolyzable by emulsin to yield an unidentified sugar and a deep blue water-soluble pigment. An alcoholic extract was evaporated to dryness and extracted with boiling acetic ether, which dissolved out the glucoside studied by Bourquelot in 1896, and which Bridel names monotropitine [(see Bot. Absts. 13, Entries 418, 429]. The ether-insoluble portion, a watery syrup, on standing 6 months yielded large elongated prismatic crystals. These were purified by repeated recrystallization from alcohol. These are colorless, acid, laevorotatory ($A_D = -130.44$), soluble in water and alcohol, insoluble in acetic ether, and do not reduce Fehling's solution. On hydrolysis with H_2SO_4 or emulsin, they yield a reducing sugar and a deep blue, optically active coloring matter. The amounts of these were too small to permit further study. The glucoside has been named monotropeine.—*Joseph S. Caldwell.*

3839. Colin, H., et H. Belval. **Les hydrocarbones solubles du grain de blé au cours du développement. [The soluble carbohydrates in wheat seed during its development.]** Compt. Rend. Acad. Sci. Paris 177: 343–346. 1923.—A table shows the data collected by 7 readings June 12–July 25, 1922, and July 2–July 24, 1923, including: amounts of starch, sucrose, levulosin, and reducing sugars; the glucose-levulose ratio; optical rotation. Sugars and levulosin decrease during the ripening period, while starch increases. The glucose-levulose ratio changes gradually from less than 30% to 80% or more. It is maintained that levulosin is a soluble reserve carbohydrate, formerly supposed to be dextrin. [See also following entry.] —*C. H. Farr.*

3840. Colin, H., et H. Belval. **Les lévulosanes dans les céréales. [The levulosanes of the cereals.]** Compt. Rend. Acad. Sci. Paris 177: 973–975. 1923.—The levulosanes of rye are found to comprise 40% of the dry weight. A table shows the analyses of rye, wheats, barley, oats, corns, and buckwheat for starch, levulosanes, sucrose, reducing sugars, and the optical rotation of the soluble carbohydrates. [See also preceding Entry.]—*C. H. Farr.*

3841. Coupin, Henri. **Sur la prétendue formation de la chlorophylle a l'obscurité. [Concerning the claim that chlorophyll is formed in darkness.]** Compt. Rend. Acad. Sci. Paris 177: 279–280. 1923.—Seeds of corn, cabbage, vetch, lupine, pumpkin, marvel of Peru, asparagus, and beans were germinated in flasks plugged with cotton. The stems in all cases were white and the leaves yellow, and no trace of green appeared. By extraction and fractional solution in acetone, absolute alcohol, dilute alcohol, and benzine, no trace of chlorophyll was found. It is therefore concluded that etiolated plants cannot form chlorophyll in the dark.—*C. H. Farr.*

3842. Fontes, G., et L. Thivolle. **Méthode de microdosage manganimétrique du lactose. Application au lait. [A manganimetric method for the determination of small quantities of lactose. Application to milk.]** Bull. Soc. Chim. Biol. 4: 23–42. 1922.—The method, applicable in determinations upon amounts as small as 0.05 cc. of milk, is a modification of the authors' method for determining small amounts of glucose (Ibid. 3: 226–237. 1922). It depends upon the fact that the copper oxide formed by reduction of copper by a reducing sugar is soluble in a mixture of sodium molybdate and phosphoric acid with the formation of suboxides of molybdenum which are intensely blue in color. The solution is then titrated with potassium permanganate. The technique is fully described.—*Joseph S. Caldwell.*

3843. Frouin, Albert, et Maylis Guillaumie. **Absence d'acides gras libres dans le Bacille tuberculeux. [The absence of free fatty acids in B. tuberculosis.]** Compt. Rend. Soc. Biol. 89: 319–320. 1923.—Various authors have reported free fatty acids from *B. tuberculosis* and have even attributed its acid-resistant nature to these acids. The present authors attrib-

ute these findings to faulty technique and to saponification through sterilization of the glycerin used in the medium. When these errors are corrected no free fatty acids are found.—*Oran Raber.*

3844. Heyl, Frederick W. **Some constituents of ragweed pollen.** Jour. Amer. Pharm. Assoc. 12: 669–676. 1923.—The author gives a final report on analyses on the constituents of ragweed pollen, the combined investigations revealing the presence of some 27 well defined substances. For previous reports see Jour. Amer. Chem. Soc. 39: 1470. 1917; 41: 670, 1285. 1919; 42: 1738. 1920; 44: 2283. 1922.—*Anton Hogstad, Jr.*

3845. Hopkins, F. Gowland. **Les mécanismes de l'oxydation dans l'organisme vivant. [The mechanism of oxidation in the living organism.]** Bull. Soc. Chim. Biol. 5: 761–772. 1923. —This is a French translation by Marc Bridel of an address by Hopkins delivered at the Fourth International Congress for Pure and Applied Chemistry at Cambridge, June 20, 1923.—*Joseph S. Caldwell.*

3846. Itano, Arao. **Physiological study of Azotobacter Chroococcum. I. Influence of vitamine B (?) and nucleic acid on Azotobacter.** Jour. Bact. 8: 483–486. 1923.—*Azotobacter* sp. is stimulated in regard to N fixation and growth by water soluble B vitamin and by phytonucleic acid. This stimulation seems to be due to an accessory influence rather than to the supply of food substance.—*C. E. Skinner.*

3847. Kolkwitz, R., und R. Kolbe. **Zur Kenntnis der Kalktuffbildung durch Grünalgen. [On the formation of lime tufa by green algae.]** Ber. Deutsch. Bot. Ges. 41: 312–316. *1 fig.* 1923.—*Vaucheria de Baryana* Wor. has the peculiarity of precipitating lime. No other species of the genus shows this characteristic. In the Siphoneae the lime formation is general. Laboratory cultures of this Vaucheria showed the formation of lime tubes. Different parts form the lime incrustation at different rates.—*Hally Jolivette Sax.*

3848. Koser, Stuart A. **Utilization of the salts of organic acids by the colon-aerogenes group.** Jour. Bact. 8: 493–520. 1923.—Sodium salts of various organic acids were studied as sources of energy for the colon bacilli. Salts of acetic, succinic, malic, lactic, mucic, and glyceric acids supported growth of both *Bacterium coli* and *B. aerogenes*. *N*-valeric, iso-valeric, *n*-caproic, oxalic, salicylic, and *o*-phthalic acid salts were not used by either organism. Salts of propionic, tartaric, and benzoic acids were utilized by some but not by all strains of the organisms. Sodium, potassium, or ammonium citrate supported growth of *B. aerogenes* but not of fecal *B. coli*. The ability to utilize citrates as a source of energy is not readily gained or lost by subculturing and seems to be a stable character. The suggestion is made that organic salts may prove of value in the differentiation of other bacteria.—*C. E. Skinner.*

3849. Levine, Max, and D. C. Carpenter. **Gelatin liquefaction by bacteria.** Jour. Bact. 8: 297–306. 1923.—The change in viscosity of a gelatin medium and simultaneous rate of increase of formol titration was observed with 7 organisms. The viscosity was found to drop before the formol titration began to rise. The rate of increase in formol titration serves to distinguish 2 types of gelatin liquefiers.—*Authors' summary.*

3850. Lubimenko, V. **Influence des blessures des feuilles sur la production de substance sèche chez les plantes vertes. [The influence of wounding of leaves on the production of dry substance by green plants.]** Compt. Rend. Acad. Sci. Paris 177: 708–711. 1923.—Using radish, the total surface of the control leaves increased during the experiment to 58 times the original. Those reduced 25% in area by cutting away parts, increased 72 times; those reduced 50% in area, increased to 78 times; and those reduced 75% in area, increased to 400 times their original area. The dry weight of leaves reduced 25% in area is greater than that of controls. Those reduced 50% and 75% had 90% and 79% respectively of the dry weight of the controls. Depriving plants of leaves increased the dry matter produced per square dcm. of leaf surface, the effect increasing with the number of leaves removed.—*C. H. Farr.*

3851. Maige, A. **Metabolisme des sucres dans la cellule et amylogénése. [The metabolism of sugar in the cell and starch deposition.]** Compt. Rend. Acad. Sci. Paris 177: 895–898. 1923.—The author has previously shown that carbohydrate starvation results in the degradation of the nucleus and cytoplasm before their disorganization and death of the cell. If during the interval between nuclear degradation and death an adequate supply of sugars is furnished, such as sucrose, maltose, lactose, glucose, levulose, or galactose, the nucleus and

cytoplasm are regenerated, and normal life is reestablished. It can be determined that a certain amount of sugar is required to bring about this revival. The appearance of starch was studied in cortex and pith of the hypocotyl of bean seedlings without cotyledons in 0.2% solution of glucose at 20°C. Bean seed germinated either with or without cotyledons in sugar solutions too weak to permit starch deposition. In other cases the enlargement of the nucleus preceded by 24 or 48 hours the deposition of starch. Similarly, cytoplasmic growth was noted in cases where no starch was deposited.—*C. H. Farr.*

3852. Owen, William L. **A study of the formation of gum levan from sucrose.** Jour. Bact. **8**: 421–445. 1923.—*Bacillus vulgatus* Trevisan and closely related species are able to form gum levan from sucrose. This property is increased by repeated subcultures on sucrose media. The gum fermentation of sucrose does not depend upon the action of invertase but is a distinct type of fermentation, by means of which a non-invertase-secreting organism can convert sucrose into assimilable forms, the combined osmotic pressure of which is less than that of the original sucrose. The optimum reaction for this fermentation is between pH 6.7 and 7.0. The action proceeds more rapidly in the absence of invertase or of monosaccharides. —*C. E. Skinner.*

3853. Proca, G. **Particularités de la lysine du B. coli. [Properties of B. coli lysin.]** Compt. Rend. Soc. Biol. **89**: 274–275. 1923.—The lytic power is maintained while in distilled water at 37°C. for at least 4 weeks. In pure glycerin the lytic power is destroyed in 24 hours at room temperature. Alcohol extracts the lysin. Exposure to the vapor of eucalyptus oil for 2–5 days does not cause a loss of the lytic properties. The effect of formaldehyde and of NaF is also given.—*Oran Raber.*

3854. Proca, G. **Sur les extraits de cultures lysogènes. [The extracts of lysin-forming cultures.]** Compt. Rend. Soc. Biol. **89**: 631–632. 1923.—*Bacillus coli* cultures on solid media are rich in lysins. Various methods are given for extracting these lytic substances.—*Oran Raber.*

3855. Raudoin, Mme. L. **La question des vitamines, II. Le facteur antiscorbutique. [The vitamin question, II. The antiscorbutic factor.]** Bull. Soc. Chim. Biol. **5**: 806–864. 1923.—A very concise summary is presented of existing knowledge, with a bibliography of 24 pages classified by topics and comprising 368 titles.—*Joseph S. Caldwell.*

3856. Read, J. W., and Barnett Sure. **Nutritive value of the Georgia velvet bean (Stizilobium deeringianum).** Jour. Agric. Res. **24**: 433–440. *10 fig.* 1923.—This paper discusses the supplementary relationship of whole and skimmed milk to the hulled seed and the whole plant, and of the leaf and the hulls to the seed. The velvet-bean seed (cooked) when fed at a level of 60% together with 40% dextrin, and velvet-bean hay (whole plant) when fed at a 40% plane of intake together with 60% starch, supplement milk in a manner satisfactory for growth and reproduction. The Georgia velvet-bean leaf is quite rich in the B vitamin and contains salts of excellent biological value. The hulls have no supplementary value, and interfere with the utilization of the A vitamin in the seed. Autoclaving for 2 hours at 15 pounds pressure did not change their disturbing effect.—*J. W. Read.*

3857. Rochaix, A., et E. Banssillon. **Sur la régénération de la fonction pigmentaire du Bacille pyocyanique par son passage sur milieux "sucrés." [The regeneration of the pigment of B. pyocyaneus by transference to "sugar" media.]** Compt. Rend. Soc. Biol. **89**: 538–539. 1923.—Races of *B. pyocyaneus* which had lost the ability to produce pigment were grown on various kinds of "sugars." The best results were obtained with glycerin, levulose, and glucose, which restored both the fluorescent green pigment and the pyocyanase. Less favorable results were obtained with mannite, sucrose, and glycogen.—Similar experiments were tried with *B. erythrogenous* but with no success.—*Oran Raber.*

3858. Srivastava, A. N. **Oxidation of tannins in myrobalans.** Indian Forester **49**: 547–550. 1923.—It has been found that the tannin content of myrobalans is considerably reduced by the ordinary process of drying, as a result of enzyme and other activities in the cell. This harmful effect has been obviated by cutting the fruit in slices and drying. A much improved product is obtained which gives clear aqueous solutions and these do not deposit ellagic acid so quickly. Antiseptics may also be used.—*E. N. Munns.*

3859. Sucharipa, Rudolph. **Protopectin and some other constituents of lemon peel.** Jour. Amer. Chem. Soc. **46**: 145–148. 1924.—Protopectin prepared from the white pericarp

of *Citrus Limonum* gave on hydrolysis pectin and cellulose and some impurities. Pectins with different methoxyl contents have been secured from the same source.—*J. M. Brannon.*

3860. Weinberg, M., et P. Goy. **Emploi de milieux à extrait alcoolique de foie pour les cultures microbiennes.** [**Use of media containing an alcoholic extract of liver for microorganisms.**] Compt. Rend. Soc. Biol. **89**: 58–59. 1923.—An addition to the medium of a 90% alcoholic extract of horse liver favors the growth of intestinal pathogens and other intestinal forms especially. The extract is added (about 10%) before sterilisation. The action is due neither to the sugar nor to the catalase, which is destroyed at 120°C.—*Oran Raber.*

METABOLISM (NITROGEN RELATIONS)

3861. Calvino, Eva Mameli de. **The direct assimilation of free nitrogen by plants.** Torreya **23**: 99–104. 1923.—The various experiments subsequent to 1909 on direct assimilation of N by phanerogamous plants are reviewed, with the conclusion that such assimilation is more general than has been heretofore admitted. It is not due wholly to the presence of symbiotic microorganisms, but also to direct assimilation by the green cells.—*J. C. Nelson.*

3862. Finks, A. J., and D. Breese Jones. **Growth-promoting value of the proteins of the palm kernel, and the vitamin content of palm-kernel meal.** Jour. Agric. Res. **25**: 165–169. *5 fig.* 1923.—The proteins of kernel meal of the palm (*Elaeis guineensis*) were found to be adequate for the normal growth of young rats when fed in a diet balanced with respect to the other dietary factors. The meal constituted 80% of the diet, which is equivalent to 15.5% of protein. Forty per cent of palm-kernel meal did not furnish sufficient vitamin A to prevent xerophthalmia, and a like quantity did not provide sufficient vitamin B for normal growth. Since the meal used was a commercial product obtained as a residue from the nuts after removal of the oil by the solvent process, the results obtained with reference to vitamin content may not necessarily apply to the fresh, untreated palm-kernel nut. Inasmuch as it is this treated commercial product which is available for the feeding of live stock, the vitamin values given in this article are of more practical value than would be those found for the fresh kernels.—*Authors' abstract.*

3863. Jones, D. Breese, A. J. Finks, and Carl O. Johns. **Nutritive value of mixtures of proteins from corn and various concentrates.** Jour. Agric. Res. **24**: 971–978. *7 fig.* 1923.—Mixtures consisting of 25 parts of tomato-seed press cake, soybean flour, or peanut flour, and 75 parts of yellow corn meal containing 12–15% of protein, have been found to furnish proteins adequate for the normal growth of albino rats when incorporated in a diet made nutritionally adequate with respect to the dietary factors other than protein. A mixture of equal parts of corn meal and cocoanut meal at a protein level of 12% was found efficient for growth at the normal rate. The growth was somewhat subnormal when the proportion of protein was reduced to 9.6%. From experiments in which the mixtures of corn meal and concentrates furnished 7.2% of protein, it is concluded, from the gain in weight per gm. of protein consumed, that the comparative growth-promoting value of the proteins of tomato seed, peanut, and soybean, as a supplement to corn proteins, is in the order: soybean, peanut, and tomato seed.—*D. B. Jones.*

3864. Tottingham, W. E., E. R. Schultz, and S. Lepkovsky. **The extraction of nitrogenous constituents from plant cells.** Jour. Amer. Chem. Soc. **46**: 203–208. 1924.—The investigation reported deals with the efficiency of various methods of drying and extraction as affecting the proportions of total soluble nitrogenous compounds and soluble proteins in leaves of barberry and sugar beet. Freezing and drying in still air at 40°C. have a disturbing effect. Drying at 55–60°C. with rapid aeration produced less change than at 65–72°C. A comparison of some methods of recovering the soluble constituents of cells is made.—*W. E. Maneval.*

METABOLISM (ENZYMES, FERMENTATION)

3865. Anonymous. [Rev. of: Schnegg, Hans. **Das mikroskopische Praktikum des Brauers. 2 Teil. Gärungsorganismen. (Handbook of microscopy for brewers. 2nd. part. Organisms of fermentation.)** *8°, viii + 513 p., 165 fig.* Ferd. Enke: Stuttgart, 1922.] Wiener Landw. Zeitg. **73**: 294. 1923.

3866. Ambard, L. **De l'amylase. Liaison du ferment et des substances qu'il digere. [Amylase. Union between enzymes and substances attacked.]** Bull. Soc. Chim. Biol. 5: 693–716. 1923.—An attempt is made to test experimentally the theory of V. Henri that in enzymic decomposition of a complex molecule there is preliminary combination of enzyme with substrate and with each of the successive degradation products prior to splitting. Di-, tetra-, and hexamylose prepared by the method of P. Karrer were employed for the reason that they are of known molecular weight, soluble in water, crystallizable, and absorb amylase. These amyloses are built up from the elementary group $C_6H_{10}O_5$ by 2 sorts of linkages, "liaisons specifiques," as that between 2 $C_6H_{10}O_5$ groups in diamylose, and "nonspecifiques," as in polymerizations. The number of specific linkages in tetraamylose is 2, that in hexamylose is unknown. If the fixation of amylase occurs at these specific linkages, the amount of amylase fixed by equal amounts of the various amyloses should indicate the number of such linkages, hence should indicate the molecular groupings in each amylose. The method employed consists in the fixation of the amylase of human saliva, upon a known quantity of the amylose to be tested, washing and centrifuging, defixing the enzyme by washing with starch paste, and estimating the amount of enzyme thus transferred to the starch paste by determining the amount of sugar formed therefrom. The fixing powers of the 3 amyloses are: diamylose, 1.00; tetramylose, 1.26; hexamylose, 2.71. The technique has been described in earlier papers [see Bot. Absts. 12, Entries 5211, 5212, 5213]. The 2nd part of the paper deals with the rôle of the adsorption of amylase in determining the rate of hydrolysis, and points out a number of factors which may produce deviations from the theoretical rate.—*Joseph S. Caldwell.*

3867. Ashesov, I. N. et J. Giaja. **Sur la survie de la levure toluénisée. [The survival of toluenised yeast.]** Compt. Rend. Soc. Biol. 89: 122–123. 1923.—Treatment with toluene does not kill yeast. Even after treatment for 72 hours there are some yeast cells which reproduce and cause fermentation when the toluene is removed. Oxygen renders the yeast more resistant to toluene, and yeast so treated may respire almost as rapidly as normal yeast, showing that yeast so treated can not be considered to be even in a state of suspended animation.—*Oran Raber.*

3868. Bridel, Marc, et Pierre Delauney. **Sur les propriétés de la loroglossine et sur ses produits de dédoublement: glucose et loroglossigenine. [On the properties of loroglossine and the products of its decomposition: glucose and loroglossigenine.]** Compt. Rend. Acad. Sci. Paris 177: 776–778. 1923.—The formula of $C_{30}H_{42}O_{18}$ is suggested for the glucoside loroglossine. Glucose and loroglossigenine were identified as the products of hydrolysis of the glucoside by emulsin. The characteristics of loroglossigenine are given.—*W. J. Robbins.*

3869. Dubois, Raphaël. **À propos d'une note de M. A. Valdiguié intitulée: "Les sels de cuivre peuvent agir à la fois comme oxydases et comme péroxydases." [Copper salts can act at the same time as oxidases and peroxidases.]** Compt. Rend. Soc. Biol. 89: 10–11. 1923.—The author calls attention to the work of M. Valdiguié which supports his own conclusions that copper salts act both as oxidases and peroxidases. He further suggests that the toxic action of copper salts on mildews and other fungi is due to the oxidising action of the salt rather than to the copper present.—*Oran Raber.*

3870. Fernbach, A., et M. Schoen. **Se forme-t-il de l'acide lactique dans la fermentation alcoolique? [Is lactic acid formed in alcoholic fermentation?]** Compt. Rend. Soc. Biol. 89: 475–477. 1923.—The history of the discussion is briefly reviewed. The author concludes from his own experiments that lactic acid is formed but broken down as quickly as formed. In this respect it is like pyruvic acid, which behaves similarly.—*Oran Raber.*

3871. Grab, Max v. **Brenztraubensäure als Zwischenprodukt der alkoholischen Zuckerspaltung. [Pyroracemic acid as an intermediate product in alcoholic fermentation of sugar.]** Biochem. Zeitschr. 123: 69–89. 1921.—The presence of pyroracemic acid as an intermediate product in alcoholic fermentation of glucose was demonstrated with 2 different cultures of yeast.—*F. G. Gustafson.*

3872. Groenewege, J. **Bakteriologische Untersuchungen über biologische Reinigung. [Bacteriological investigations on biological purification.]** Bull. Jard. Bot. Buitenzorg 2: 203–236. 1920.—The author reports experiments dealing with the origin of gases in cess-pools (Faulkammern) and in denitrification.—*C. C. Epling.*

3873. Groenewege, J. **Die Nitrosoindolreaktion.** Bull. Jard. Bot. Buitenzorg 2: 335–345. 1920.—The author discusses the nitrosoindol reaction with reference to *Vibrio cholerae* and by the use of denitrifying organisms establishes the presence of traces of NO_3 in peptone media. He cites limiting conditions for the reaction.—*C. C. Epling.*

3874. Groenewege, J. **Untersuchungen über die Zersetzung der Zellulose durch aërobe Bakterien. [Investigations on the decomposition of cellulose by aerobic bacteria.]** Bull. Jard. Bot. Buitenzorg. 2: 261–314. 1920.—The author emphasizes the importance of aerobic as contrasted with anaerobic decomposition of cellulose in the soil. He seeks to show that this decomposition is effected through the activities of 2 groups of organisms: a cellulose-destroying group and a denitrifying group, the latter dependent upon the decomposition products resulting from the activities of the 1st group. Methods are given for the isolation of these organisms and their properties are described. The enzyme cellulase is also discussed.—*C. C. Epling.*

3875. Harada, Ken. **Über die Spaltung der Stärke durch Amylase I. [The conversion of starch by amylase.]** Jour. Biochem. Tokyo 3: 149–165. *2 fig.* 1923.—This preliminary paper describes the methods employed by the author for preparing pure amylose and amylopectin from potato starch and for making a maltose-free amylase from malt. A forthcoming paper is to state the experimental results.—*Joseph S. Caldwell.*

3876. Harter, L. L., and J. L. Weimer. **Influence of the substrate and its hydrogen-ion concentration on pectinase production.** Jour. Agric. Res. 24: 861–878. 1923.—These investigations were made by growing *Rhizopus Tritici* on the following media: string bean, prune, Irish potato, carrot, turnip, and sweet potato decoction, and on Czapek's, Pfeffer's, and Richard's synthetic media, and on beef bouillon. The cell-wall-dissolving enzym, pectinase, was produced on all the vegetable decoctions except prune, but not on the synthetic media or beef bouillon when glucose was used as a source of carbon. If pectin was used as the only source of carbon in Czapek's solution an active enzym was produced. Adjusting these solutions to different pH values had no influence on the production of pectinase in Czapek's solution and sweet potato decoction. The best growth as measured by dry weight of mycelium took place at the lowest H-ion concentration. The substrate influenced the production of pectinase; the H-ion concentration did not. The results indicate a well-marked qualitative action of the substrate on production of the macerating enzym.—*L. L. Harter.*

3877. Iwanoff, Nicolaus N. **Über die Verwandlung stickstoffhaltiger Substanzen bei den Endphasen der Hefenautolyse. [The transformation of nitrogenous compounds in the final phases of yeast autolysis.]** Biochem. Zeitschr. 120: 1–24. 1921.—It has been previously observed both by the author and by Kostitschew and Brilliant that when the autolysis of yeast is allowed to proceed almost to completion and the solution is then made alkaline and the temperature increased to 55–60°C., there is a decrease in the amount of N precipitable by lead acetate and an increase in the amount of protein N as determined by Stutzer's method. The amount of this change is greatest when the autolysis is about ½ complete and decreases or becomes nil as it approaches completion. There is no formation of ammonia hence deamination plays no part, nor is there any reduction of carboxyl groups. The increase in protein N is not accompanied by a decrease in amino acids as determined by Van Slyke's method, hence must be accomplished by transformation of more complex products of the autolysis, probably from albumoses and peptones. It is not observable in races of yeasts rich in peptase; these show a reduction of the N determinable by Van Slyke's method when alkalinized, due to the formation of humin-like substances by combination with carbohydrates present in the autolysate. Leucin and galactose kept 3 months under toluol at 40°C. without addition of yeast showed similar formation of humin substances.—*Joseph S. Caldwell.*

3878. Iwanoff, Nicolaus N. **Über den Einfluss der Gärungsprodukte auf den Zerfall der Eiweiss-stoffe in den Hefen. [The influence of fermentation products upon the decomposition of the proteins of yeast.]** Biochem. Zeitschr. 120: 62–80. 1921.—The rate of hydrolysis of the proteins of yeast in autolysis is decreased by acid potassium phosphate or by the alcoholic products of the fermentation of sugar, in lesser degree by alcohol of equal concentration or the neutralized products of fermentation. The alteration of H-ion concentration is the primary factor in producing the results; the alcohol concentration is a less potent factor.—*Joseph S. Caldwell.*

3879. Iwanoff, Nicolaus N. **Über Eiweissspaltung in Hefen während der Gärung. [Protein hydrolysis in yeast during fermentation.]** Biochem. Zeitschr. **120**: 25–61. 1921.—When yeast acts upon a medium containing nitrogenous compounds, the simultaneous decomposition and synthesis of protein which it brings about [see preceding entry] make it impossible to differentiate those nitrogenous constituents derived from the medium from those synthesized by the yeast, or arising from the destruction of its own proteins. The author has consquently studied the nature of the nitrogenous substances present at the end of fermentation when yeast is allowed to act upon pure sugars. There is an unmistakable decomposition of protein during the fermentation. This has been overlooked by earlier workers by reason of the fact that they relied upon Stutzer's method of precipitation by copper hydroxide in following the changes occurring in proteins. Stutzer's reagent precipitates also humin-like substances produced by combination of amino acids with sugar. Lead acetate does not precipitate these bodies, hence its use reveals a progressive decrease in protein N throughout the fermentation. This decrease is more rapid in yeast allowed to autolyze in the absence of sugar. The filtrate after precipitation with lead acetate gives a further precipitate with copper hydroxide; this consists of humins, which are present as traces only in the autolysate, but which are much larger in amount when sugar is present. The amount of humins formed bears no relation to the rate of fermentation, the yeast serving only as a source of nitrogenous material. Fermentation therefore does not stand in causal relation to their production. The humins are not decomposed by the enzymes of yeast hence cannot serve as sources of N for growth.—*Joseph S. Caldwell.*

3880. Karczag, L. **Studien über Oxydationskatalysen. II. [Studies on oxidation catalysis.]** Biochem. Zeitschr. **119**: 16–22. 1921.—The oxidising activity of ferrous and ferric compounds are compared using dyes as indicators.—*Oran Raber.*

3881. Kumagawa, H. **Über die Dismutation verschiedener Aldehyde durch Hefe. [On the dismutation of different aldehydes by yeast.]** Biochem. Zeitschr. **123**: 225–230. 1921. —Yeast possesses enzymes which bring about the Cannizzaro reaction with several aldehydes, i.e., 1 molecule of aldehyde is reduced to the corresponding alcohol, for every 1 oxidized to the corresponding acid. Isovaleric, isobutyl, and benzaldehydes and oenanthol were used.—*F. G. Gustafson.*

3882. Kumagawa, H. **Über die Einwirkung von Salzen auf die Entfärbung des Methylenblaus durch verschiedene Hefesorten. [The influence of salts on the decolorization of methylene blue by various yeasts.]** Biochem. Zeitschr. **121**: 150–163. 1921.—The question whether salts inhibit the reductase of yeast and thus prevent the decolorization of methylene blue is complicated by the fact that many salts, e.g., cadmium bromide, chloride or nitrate, chlorides of aluminum or mercury, lead acetate, uranyl acetate, or lead nitrate, precipitate the dye more or less completely, leaving the solution partially or totally decolorized. The author finds that various races of yeast differ widely in their power to decolorize methylene blue, some being devoid of such power. Others which possess it may or may not show a decrease in the presence of cadmium salts. Lead acetate, potassium alum, and aluminum chloride very markedly decrease decolorizing power; $MgCl_2$ and $MgSO_4$ are less effective. $Zn(NO_3)_2$ and $Hg(NO_3)_2$ decrease decolorization in most races of yeast but have little or no effect upon others. The reducing power of a given race of yeast varies in different samples prepared by slightly different methods and is probably profoundly influenced by physiological factors.—*Joseph S. Caldwell.*

3883. Němec, Antonin, und Františck Duchon. **Versuche über Vorkommen und Wirkung der Saccharophosphatase im Pflanzenorganismus. [The existence and action of saccharophosphatase in plants.]** Biochem. Zeitschr. **119**: 73–80. *1 fig.* 1921.—In seeds from several cultivated plants as well as in the leaves of *Solanum tuberosum* an enzyme capable of splitting off phosphoric acid from phosphosaccharids was found. Watery extracts from the seeds liberated insoluble calcium phosphate from calcium saccharophosphate. The strongest enzymatic action was shown by oily seeds, e.g., *Pinus sylvestris*, but even starchy and nitrogenous seeds showed considerable activity in splitting sodium saccharophosphates.—A small addition of alkali stops the enzymatic activity completely while slight acidity increases it.—*Oran Raber.*

3884. Neuberg, Carl, und Ludwig Liebermann. **Zur Kenntnis der Carboligase. II. Mitteilung. [On carboligase. Second communication.]** Biochem. Zeitschr., **121**: 311–325. 1921.—By the addition of low concentrations of orthochlorbenzaldehyde to a cane-sugar solution inoculated with selected strains of brewery yeasts, the authors were able to demonstrate the formation of orthochlorbenzylalcohol. As benzaldehyde is quite toxic, it must be added in successive small portions at ½-hour intervals and the concentration must not exceed 0.31%. Orthochlorbenzoic acid was also produced in smaller amount.—*Joseph S. Caldwell.*

3885. Neuberg, Carl, Elsa Reinfurth, und Marta Sandberg. **Neue Klassen von Stimulatoren der alkoholischen Zuckerspaltung. VII. Mitteilung über chemisch definierte Katalysatoren der Gärung. [New groups of stimulatory substances for alcoholic fermentation of sugars. Seventh communication on chemically defined catalyzers of fermentation.]** Biochem. Zeitschr. **121**: 215–234. 1921.—Neuberg and his pupils have shown in preceding papers of the series that 76 aldehydes of dissimilar character and varied molecular weight accelerate the fermentation of sugar by yeast, and have deduced the generalization that substances possessing the aldehydic function in the widest sense have an activating effect upon alcoholic fermentation. The present paper reports experiments with purins, including adenin, hypoxanthin, xanthin, guanin, hetero xanthin, 8-methylxanthin, paraxanthin (synthetic), theobromin, theophyllin, caffein, tetramethylxanthin, trichlortetramethylxanthin, tetrachloratetramethyl-xanthin, uric acid, urates, with the purin glucosides guanosin and adenosin, with nucleic acids from yeast, thymus, fishsperm, spleen, and with decomposition products of purins, as allantoin and alloxanthin. In every case there was an increase in the rate of fermentation of glucose by yeast as measured by CO_2 evolved. With some of the nucleic acids there was a decrease in the rate of gas production before the end of the experimental period, possibly due to decomposition of the acid by yeast enzymes with the formation of toxic substances.—*Joseph S. Caldwell.*

3886. Palmer, Leroy S. **The influence of various antiseptics on the activity of lipase.** Jour. Amer. Chem. Soc. **44**: 1527–1538. 1922.—Formaldehyde in concentration of 1 part in 250 had no detrimental effect on the activity of lipase. A 1% solution retarded the action of the enzyme. Chloroform in concentrations of 1.5–2.5% retarded the lipase activity 20–60%. Acetone in concentrations of 6–12% retarded the lipolysis 12–25%. A solution of 0.3% iodoform in acetone retarded the lipase action 25–40%. A similar solution of iodoform which had stood for some time caused a complete inhibition at this and weaker concentrations.—*J. M. Brannon.*

3887. Plagge, H. **Vergleichende Untersuchung über die gärungshemmende Wirkung einiger Chlorderivate des Methans, Äthans und Äthylens. [The comparative antifermentative action of some chlorine derivatives of methane, ethane and ethylene.]** Biochem. Zeitschr. **118**: 129–143. *1 fig.* 1921.—Ethylidene chloride, ethylenedichloride, dichlormethane, chloroform, and tetrachlorethane are poisonous to yeast cells. The degree of injury varies with the amount of poison and the length of the presentation time. The decisive factor is not the concentration of the poison but the relation of the amount of the poison to the mass of the yeast cells.—*Oran Raber.*

3888. Rona, P., und Dora Reinicke. **Beiträge zum Studium der Giftwirkung: Über die Wirkung des Chinins auf Serumlipase. [Contributions to the study of toxic action: the action of quinine on serumlipase.]** Biochem. Zeitschr. **118**: 213–231. *12 fig.* 1921.—The toxic action of quinine hydrochloride on serum lipase follows the same course as that of ethoxyl; the toxicity is directly proportional to the logarithm of the concentration of the toxin. No protective action of tributyrin, as in the case of ethoxyl, is seen. It is immaterial in what order the constituents of the mixture are added. The toxicity of the quinine salt depends upon the H-ion concentration. The different quinine salts behave identically. To obtain the same action in animal serum (cat) as in human serum the concentration of the quinine must be 100–1000 times greater. If cat and human serum are mixed no protective action is seen but an additive one. In using ethoxyl and quinine together in case the quinine is added first to the enzyme, the ethoxyl seems to be removed by the enzyme and the quinine acts as though the ethoxyl were not present; but if the ethoxyl is added first then there is an additive effect.—*Oran Raber.*

3889. Ruehle, G. L. A. **The enzymic content of bacterial spores.** Jour. Bact. 8: 487–491. 1923.—Preliminary experiments indicate that bacterial spores exhibit some enzymic activity even when there is no evidence of germination.—*C. E. Skinner.*

3890. Sasaki, Takaoki, und Jiro Kinose. **Über den Abbau des d, l-Alpha-Naphthalanins durch Proteusbakterien.** [**The decomposition of d, l-alphanaphthalanin by Proteus bacteria.**] Biochem. Zeitschr. 121: 171–174. 1921.—D, l-alphanaphthalanin was made by combining glycin anhydride and alphanaphthaldehyde in the presence of sodium acetate and anhydrous acetic acid and reducing the condensation product in the presence of red P and HI. The bacteria were allowed to grow 40 days at 37°C. in a medium containing the product, after which dextrorotatory alphanaphthyllactic acid was isolated from the solution. The authors hope that through such biological methods it may be possible to produce optically active alcohol acids from other synthetic amino acids.—*Joseph S. Caldwell.*

3891. Sasaki, Takaoki, und Ichiro Otsuka. **Über den Abbau des l-Tryptophans durch Proteusbakterien.** [**The decomposition of l-trytophan by Proteus bacteria.**] Biochem. Zeitschr. 121: 167–170. 1921.—*Bacillus proteus* was allowed to act upon l-trytophan for 44 days at 37°C. From the decomposition products l-indol-lactic acid was isolated in amount equal to 15.25% of the tryptophan employed. It has previously been found by Ehrlich and Jakobson (Ber. Deutsch. Chem. Ges. 44: 888– , 1911) in the end products of the action of *Oidium lactis* upon tryptophan.—*Joseph S. Caldwell.*

3892. Schenker, Robert. **Zur Kenntnis der Lipase von Aspergillus niger (van Tiegh.).** [**The lipase of Aspergillus niger.**] Biochem. Zeitschr. 120: 164–196. 1921.—*Aspergillus niger* grew and formed spores on an inorganic medium containing castor oil, oleic, palmitic or stearic acid, triolein, tripalmitin, tristearin or triacetin as carbon sources, but could not use the ethyl esters of butyric, malonic, succinic, or benzoic acids. An acetone preparation, a glycerin extract made by grinding the mycelium with sand, a water extract, and an extract made by pressing the mycelium contained lipase, and the enzyme was isolated from these by precipitation with alcohol. Lipolytic activity of a given preparation was determined by the nature of the source of carbon employed; preparations from mycelia grown on cane sugar had less than $\frac{1}{3}$ the activity of those grown on hazelnut oil. Conditions which favor maximum growth of the fungus favor maximum lipase production; it is greatest in amount in young cultures—48 hours—and decreases rapidly with age. Lipolytic activity is greatest at 40°C. but is reduced only $\frac{1}{2}$ by drying for 1 hour at 100°C. Activity is progressively inhibited by increase in the amount of glycerin present, while the degree of inhibition produced by the accumulation of free acid is determined by the dissociation of the acid present. The bibliography contains 70 references. —*Joseph S. Caldwell.*

3893. Schnegg, Hans. **Das mikroskopische Praktikum des Brauers. 2 Teil. Gärungsorganismen.** [**Handbook of microscopy for brewers. 2nd. Part. Organisms of fermentation.**] *viii + 513 p., 165 fig.*. Ferd. Enke: Stuttgart, 1922. [See also Bot. Absts. 13, Entry 3865.]

3894. Somogyi, R. **Wirkung von Säuren auf die Hefegärung.** [**Action of acids on fermentation by yeast.**] Biochem. Zeitschr. 120: 100–102. 1921.—The effects of a series of inorganic and organic acids upon the rate of fermentation of sugar by yeast were studied. The degree of inhibition observed depends not only upon H-ion concentration, but also upon the effects upon surface tension, absorption of water, and flocculation. This conclusion is in agreement with the theory of Traube [see Bot. Absts. 13, Entry 3897] and the work of Neuberg and Ehrlich [see Bot. Absts. 12, Entry 1463] with aliphatic and cyclic alcohols.—*Joseph S. Caldwell.*

3895. Thomas, Pierre. **À propos de l'action "oxydasique" et "peroxydasique" des sels de cuivre.** [**The "oxidase" and "peroxidase" action of copper salts.**] Compt. Rend. Soc. Biol. 89: 343–345. 1923.—In the presence of H_2O_2 copper salts oxidise phenolphthalein (Kastle-Meyer). This oxidation is retarded by organic acids. The cause of this retardation is studied but no general conclusions are reached.—*Oran Raber.*

3896. Tomita, M. **Über die Umsetzung der d-Galaktose nach der zweiten Vergärungsform.** [**The conversion of d-galactose according to the second type of fermentation.**] Biochem. Zeitschr. 121: 164–166. 1921.—Analyses of the products of fermentation by yeast of galactose dissolved in Neuberg-Reinfurth's salt solution showed the presence of acetaldehyde and

glycerin in molecular proportions. The course of the fermentation is like that in the other fermentable hexoses.—*Joseph S. Caldwell.*

3897. Traube, J. **Nochmals die Wasserstoffionen. [The hydrogen ion again.]** Biochem. Zeitschr. 120: 108–110. 1921.—The author believes that undue emphasis has been laid upon alterations of H-ion concentration in biological studies, and cites the work of Traube and Somogyi and Somogyi [see Bot. Absts. 13, Entry 3894] as evidence that other factors which cannot be disregarded play a role in the results observed.—*Joseph S. Caldwell.*

METABOLISM (RESPIRATION, FERMENTATION)

3898. Terroine, Emile-F., R. Bonnet, et P. H. Joëssel. **Composition des graines et rendement enérgétique dans la germination. [The composition of seeds and the energy liberated during germination.]** Compt. Rend. Acad. Sci. Paris 177: 900–903. 1923.—A table shows the protein content, non-nitrogenous extractives, fat content, and available energy for germination, both the average and extreme, for sorghum, pea, lentil, peanut, and flax seeds. In available energy sorghum is highest, and peanut and flax lowest, while in fat content the reverse is true. Sorghum is also lowest in protein. Peas and lentils are about equal to peanuts and flax in proteins, and about equal to sorghum in fats. It is concluded that the available energy is independent of the species, but varies with the composition of the seed. [See also following entry.]—*C. H. Farr.*

3899. Terroine, Emile-F., R. Bonnet, et P.-H. Joëssel. **Influence de la température sur le rendement enérgétique dans la germination. [The influence of temperature upon the liberation of energy during germination.]** Compt. Rend. Acad. Sci. Paris 177: 212–214. 1923.—The peanut was studied at 17.5 and 30°C. respectively, the plant being grown until it was 30 cm. long. At the lower temperature this required 30 days, at the higher temperature, 5–10 days, the energy consumed being the same. Lentils were grown at 11, 18, and 30°C., respectively, until they were 9 cm. long. This required 10 days at the lowest temperature and 6–7 days at the higher temperatures. While temperature markedly affects the rate of development, it has apparently no effect on the energy consumed during germination. [See also preceding entry.]—*C. H. Farr.*

3900. Warburg, Otto. **Physikalische Chemie der Zellatmung. [Physical chemistry of cell respiration.]** Biochem. Zeitschr. 119: 134–166. 1921.—Experiments with cells show that respiration takes place only in connection with solid particles, even after the cells are broken up. The effectiveness of narcotics on respiration is not in accordance with their ability to enter the cell, but with their adsorption by the cell. Iron seems to play a part in respiration, probably as an oxygen carrier; this activity is checked by HCN.—Oxalic and amino acids like cystin adsorbed on blood charcoal show an oxidation similar to the respiration in living cells. Narcotics influence this system as they do the cell. The rate of oxidation depends upon the rate of adsorption on the charcoal. Less amino acid is adsorbed from a solution with a narcotic than when alone. Narcotics are able to displace amino acids already adsorbed on the charcoal; this reduces the oxidation as in the cell. Amounts of HCN, smaller than calculated necessary to replace any of the acid, reduce or stop oxidation of amino acids on charcoal. The HCN is thought to act on the iron in the charcoal to check its activity. Benzoic acid charcoal contains $\frac{1}{20}$ as much iron as blood charcoal and its rate of oxidation of cystin was only $\frac{1}{3}$ as rapid as the latter. If benzoic acid charcoal adsorbs iron from a solution and is then heated to glowing the rate of oxidation increases 2–3 times. The addition of iron unless heated to glowing afterwards does not increase oxidation, but may decrease it, showing that it is not only the amount but also the form of iron that seems to be of influence. The surface of the charcoal particles may be supposed to be mosaic, made of heavy metallic and non-metallic areas, all adsorbing organic materials equally well. HCN, due to its affinity for heavy metals, is readily adsorbed by them. Difficultly oxidizable substances like cystin are oxidized only when in contact with heavy metals. When charcoal having cystin adsorbed on it is placed in an HCN solution the acid displaces the cystin from the metallic areas and the oxidation of the latter stops. The intense activity of the HCN depends according to this theory upon the elective replacement of cystin from the place of oxidation.—Cell respiration is a capillary-chemical reaction taking place on the surface of the iron-containing solid cell

constituents. By adsorption on these surfaces the inert organic compounds are made reactive toward oxygen, as was the cystin on the surface of blood charcoal. Cell respiration is not declared to be physical in nature, though it is compared with phenomena of the inorganic world. Narcotics retard respiration by replacing the oxidizable material on the surfaces in the cell.—*F. G. Gustafson.*

3901. Weber, Friedl. **Veranschaulichung der Lentizellenwegsamkeit durch die H_2O_2-Methode. [Demonstration of the behavior of lenticels by the H_2O_2 method.]** Ber. Deutsch. Bot. Ges. **41**: 336–337. 1923.—The author gives a new method, called the H_2O_2 method, which shows the opening into lenticels and other breathing pores. This method succeeds best on young twigs 1– several years old.—*Hally Jolivette Sax.*

3902. Weinberg, M., et P. Aznar. **Le bacille pyocyanique et les microbes anaérobies. [The pyocyanase bacillus (Ps. pyocaneae) and anaerobic microorganisms.]** Compt. Rend. Soc. Biol. **89**: 466–468. 1923.—The pyocyanase bacillus was grown in cultures with *B. perfringens*, *B. oedematiens*, *B. sporogenes*, *B. fallax*, *B. aerofoetidus*, *B. tertius*, *B. putrificus*, *B. bifermentans*, and *B. botulinus*. When these anaerobic forms are sown in cultures where the pyocyanase bacillus has been growing their growth is much favored, due to the extraction of the available O_2. The toxin produced by forms like *B. perfringens* is also slightly more toxic. If, on the other hand, the anaerobic forms are started first the growth of *Ps. pyocaneae* is somewhat hindered.—*Oran Raber.*

ORGANISM AS A WHOLE

3903. Asheshov, Igor N. **L'attenuation du bactériophage par vieillissement. [The attenuation of the bacteriophage by age.]** Compt. Rend. Soc. Biol. **89**: 118–119. 1923.—Additional support of the bacteriophage theory is advanced. The lytic action of old bacteriophage culture filtrate is not so active as fresh filtrate and regains its lytic power after a few transfers to cultures containing bacteria. This is a characteristic of microorganisms.—*Oran Raber.*

3904. Asheshov, Igor N. **Quelques recherches sur la nature des plages de bactériophage. [Researches on the nature of bacteriophage colonies.]** Compt. Rend. Soc. Biol. **89**: 120–121. 1923.—The concentration of the "lytic principle" plays no role in the development of colonies, there is no absorption of the "lytic principle" by even the most sensitive bacteria, and there is no lytic substance dissolved in the medium away from the colonies. Consequently it is very doubtful whether any bacteriophagic substance is dissolved in the liquid. One is dealing with numbers of bacteria and not quantity of substance, which supports the theory of the bacteriophage as an organism.—*Oran Raber.*

3905. Buch, H. **Über Kutikula bewohnende Mikro-organismen der Lebermoose. [On microorganisms inhabiting the cuticle of liverworts.]** Comment. Biol. Soc. Sci. Fenn. **1**[5]: 1, 2. 1922.—The author finds that bacteria are constantly present among the cuticular papillae of the leaf-cells in certain species of Hepaticae and suggests that they may play a part in enabling the plants to utilize the free N of the air. In support of this idea he was able to prove by experiment that the species in question are unable to live in a N-free culture medium but that they grow vigorously if infected by plants bearing the bacteria.—*A. W. Evans.*

3906. Cholodny, N. **Zur Frage nach der Rolle der Ionen bei geotropischen Bewegungen. [The role of ions in geotropic movements.]** Ber. Deutsch. Bot. Ges. **41**: 300–312. 1923.—The author has made a critical study of Small's work, The Hydrion Differentiation Theory of Geotropism [see Bot. Absts. 11, Entry 716]. Only the fundamental conception that under the influence of gravity a change of position of the electrically laden particles takes place in the protoplasm is accepted. The author holds on the basis of his own experiments that the geotropic curvatures obtained in an atmosphere containing a high percentage of CO_2 are only passive, due to the weight of the stems themselves.—*Hally Jolivette Sax.*.

3907. Dauvergne, J., et L. Weil. **Sur la culture des plantes en milieu liquide stérile. [The cultivation of plants in sterile culture solutions.]** Compt. Rend. Acad. Sci. Paris **177**: 889–892. 1923.—The technique of Mazé was modified, especially by the construction of an aluminum support. Corn, peas, beans, Cobaea, Sophora, and vetch were used. The seeds were sterilized according to Mazé's method. The apparatus was found free from aerial

spores, especially those of the moulds. The corn, vetch, and peas were brought to the flowering and fruiting stages. It was found that if the leaves lost color, a little of a sterile solution of ferric-potassium citrate stimulated bud development, and no more loss of leaves occurred. —*C. H. Farr.*

3908. Faber, F. C. von. **Zur Physiologie der Mangroven. [The physiology of the mangrove.]** Ber. Deutsch. Bot. Ges. 41: 227–234. 1923.—This is a complete summary of results of a study of the mangrove, the details of which are to be published later. The study shows that the mangrove is a facultative halophyte, that transpiration is pronounced, that it experiences no injury due to salt concentration in the tissue, that removal of the salt is possible, and that it can flourish well in a strongly saline location.—*Hally Jolivette Sax.*

3909. d'Herelle, F. **Observations au sujet des expériences concernant le phénomène de bactériophagie. [Observations on the phenomenon of bacteriophage.]** Compt. Rend. Soc. Biol. 89: 231–233. 1923.—The conclusion is reached from various cultural experiments with Shiga's Bacillus that the bacteriophage is corpuscular and not a substance in solution.—*Oran Raber.*

3910. Maximow, N. A., und Elisabeth Lebedincev. **Über den Einfluss von Beleuchtungsverhältnissen auf die Entwicklung des Wurzelsystems. [Influence of illumination on the development of the root system.]** Ber. Deutsch. Bot. Ges. 41: 292–297. 1923.—For these experiments buckwheat, *Impatiens parviflora*, and *Phaseolus vulgaris*, adapted to sunlight, shade, and intermediate condition, respectively, were grown both in shade and sunlight. In all cases plants grown in sunlight had a larger root system than those grown in shade. The increased growth in sunlight is attributed to increased transpiration.—*Karl Sax.*

3911. Mez, Carl. **Anleitung zu sero-diagnostischen Untersuchungen für Botaniker. [A guide to serum diagnosis for botanists.]** Bot. Archiv 1: 177–200. *2 fig.* 1922.—A detailed description of the entire technique of serum diagnosis of plant relationships is given.—*William Seifriz.*

3912. Muller, L. **Un nouveau milieu d'enrichissement pour la recherche du Bacille typhique et des paratyphiques. [A new medium for researches on B. typhosus and B. paratyphosus.]** Compt. Rend. Soc. Biol. 89: 434–437. 1923.—It is often difficult to keep *B. typhosus* from being crowded out in laboratory studies by *B. coli*. A differentiating medium is described containing tetrathionates.—*Oran Raber.*

3913. Northrop, John H., and Paul H. DeKruif. **The agglutination of bacteria.** Science 57: 224–226. 1923.—This is a summary of work described in detail elsewhere [see Bot. Absts. 11, Entry 3285].

3914. Omelianski, V. L. **Aroma-producing microorganisms.** Jour. Bact. 8: 393–419. 1923.—The author presents a general discussion of the subject and a résumé of the work done, particularly by himself in Russia. A new species, *Bacterium esteroaromaticum*, is described. —*C. E. Skinner.*

3915. Wolff, J. **Contribution à la connaissance des phénnomènes de symbiose chez les Orchidées. [Contribution to a knowledge of symbiosis in orchids.]** Compt. Rend. Acad. Sci. Paris 177: 554–555. 1923.—Noel Bernard found that endophytes of orchids after a time lose the property of adapting themselves to symbiosis. Burjeff and Lamy do not agree with this view. A study is made of *Rhizoctonia* on *Cattleya*. It is found that the fungus does not germinate on seed 3 months old: whereas a 3-months-old fungus grows on fresh seed. The age of the seed thus seems to explain the apparent loss of adaptability to symbiosis.—*C. H. Farr.*

GROWTH, DEVELOPMENT, REPRODUCTION

3916. Borrel, A., L. Boëz, et A. de Coulon. **Facteurs accessoires de la croissance du Bacille tuberculeux. [Factors promoting growth of B. tuberculosis.]** Compt. Rend. Soc. Biol. 89: 191–193. 1923.—*B. tuberculosis* elaborates a filterable substance which promotes its growth even when present in very small amounts. This substance is not specific but is produced by cultures of various microörganisms such as yeast and mold and is even found in blood. The activating power is more evident after heating to 100°C. When heated in an oven for 1 hour at 170°C. the action is suppressed.—*Oran Raber.*

3917. Brannon, J. M. **Influence of glucose and fructose on growth of fungi.** Bot. Gaz. 76: 256–273. 1923.—The author in a previous paper [See Bot. Absts. 13, Entry 2032] maintained that glucose is primarily a respiratory sugar and fructose a tissue former. The present paper deals with the growth of certain fungi, namely: *Penicillium Camembertii*, *Aspergillus niger*, *Cylindrocladium scoparium*, and *Fusarium* sp., as influenced by certain sugars when added in varying concentrations to Czapek's nutrient solution. The sugars employed were levulose, dextrose, sucrose, and maltose. The amount of growth of the various forms for given periods was determined by weighing the dried mycelial mat obtained by culture in flasks. The several fungi were found to use dextrose and levulose somewhat similarly; neither sugar appears to be superior to the other.—*F. A. Wolf.*

3918. Ellis, M. M., and W. H. Eyster. **Some effects of insulin and glucokinin on maize seedlings.** Science 58: 541–542. 1923.—A strain of maize that is chlorotic and apparently unable to use its carbohydrates properly, was treated in the seedling stage with these compounds. In solutions of 1-0.005% of glucokinin (from onion tops) or in "corresponding dilutions" of insulin, growth was retarded, particularly in the case of the roots. In weaker solutions some benefits to growth were observed and in all concentrations more chlorophyll appeared in the leaves. Seedlings treated after removal of the end of the primary root made better growth than those with uncut roots. These results are interpreted to mean that some injurious substance enters through the root while the beneficial substances enter slowly unless the roots are cut.—*C. J. Lyon.*

3919. Hall, Ivan C. **The titrametric adjustment of the hydrogen ion concentration of bacteriologic culture media.** Jour. Bact. 8: 387–392. 1923.

3920. Janert, Heinz. **Beitrag zur Beurteilung der klimatischen Wachstumsfaktoren Kohlensäure, Sauerstoff und Luftdruck. [A consideration of carbon dioxide, oxygen, and atmospheric pressure as growth factors.]** Bot. Archiv 1: 155–176, 201–210. *Fig 1–7.* 1922.—The abnormal plant growth due to a decrease in atmospheric pressure is not to be ascribed directly to the reduced pressure, but solely to a decrease of those component parts of the air which influence plant growth. The optimum of O_2 for plant growth is 15% when the atmosphere contains 5% CO_2. The proportion of dry weight of culms to per cent of O_2 remains constant between 0.0 and 95.0% O_2. The factor constant for O_2 is 0.1. The factor for CO_2 is variable depending on light intensity.—*William Seifriz.*

3921. McCrea, Adelia. **Longevity in spores of Aspergillus oryzae and Rhizopus nigricans.** Science 58: 426. 1923.—Conidiospores of *A. Oryzae* that were dried and sealed in a tube in 1897, were opened in 1919 and inoculations were made upon 12 media. Germination and growth occurred in every case and no loss of vigor or physiological activity was found in the strain, which is still maintained. By accident, spores of *Rhizopus nigricans* were included and showed the same longevity.—*C. J. Lyon.*

3922. Nuttall, G. H. F. **Symbiosis in animals and plants.** Nature 112: 657–660. 1923. —This is the presidential address to Section I (Physiology) of the British Association at Liverpool on Sept. 13, 1923. The author reviews briefly the conditions in lichens, root nodules, and mycorrhiza. Symbiosis is regarded as balancing between the extremes of complete immunity and deadly infective disease. There is no definite boundary between symbiosis and parasitism, and the former must have originated through a preliminary stage of the latter.—*O. A. Stevens.*

3923. Robbins, Wm. J., and W. E. Maneval. **Further experiments on growth of excised root tips under sterile conditions.** Bot. Gaz. 76: 274–287. *Fig. 1–3.* 1923.—This paper reports some data not presented in the authors' previous studies [see Bot. Absts. 12, Entries 2796, 2797]. In a 24-hour day period excised corn root tips under sterile conditions make a greater gain in length and produce more secondary roots in the dark in Pfeffer's solution containing 4% dextrose, than when 0.2, 0.5, 1, 2, or 6% dextrose is present. When the root tip tissue of excised roots is transferred at 2-week intervals, the gain in the dark in the 3rd period is about the same in Pfeffer's solution containing 2–4 or 6% dextrose. Excised corn root tips 0.35 cm. long grow as much, and produce almost as many secondary roots, in 2 periods of transfer, as roots whose average original length is 6 cm. Extracts of corn grains, corn seedlings, corn endosperm, Canada field peas, clover, and metagen were not found to favor the growth of

excised tips to any marked degree. Excised root tips of corn in sterile Pfeffer's solution without dextrose may remain capable of growth for 12 days at room temperature in the dark. Excised root tips from grains from the middle of the ear grew somewhat more than those from the tip or butt. Excised root tips of beans, morning glory, alfalfa, mustard, wheat, sunflower and flax make considerable growth under sterile conditions in Pfeffer's solution containing 2% dextrose. The results with radish, watercress, squash, and buckwheat were inconclusive. The root tips of white lupine could not be grown in Pfeffer's solution containing various organic materials; 1 root tip out of 90 grew and that to a length of 68 cm.—*B. W. Wells.*

MOVEMENTS OF GROWTH AND TURGOR CHANGES

3924. Ricome, H. **Croissance et héliotropisme.** [**Growth and heliotropism.**] Compt. Rend. Acad. Sci. Paris 177: 135–136. 1923.—A study is made of beans as to their deviation from the vertical due to heliotropism by one-sided illumination. Plants were grown in pots which were covered with black paper boxes into which the light penetrated only through a minute opening in the lower half of one side. Although the stem inclined toward the light, the orientation was not on the average in the direction of the incident light rays. In all cases studied the plants did not remain in the illuminated beams of light, but penetrated the zone of shadow. During the night gravity operated to raise the inclined stem; during the day the light brought about a lowering. The increase in weight during development resulted in greater terminal effect of gravity, which resulted in a further bending day by day, so that during the latter part of the experiment the daylight raising was eliminated. It is concluded that some of the reactions previously attributed to phototropism are a response of the plant to gravity coincident with heliotropic exposure and reaction.—*C. H. Farr.*

GERMINATION, RENEWAL OF ACTIVITY

3925. Abbott, Ouida. **Chemical changes at beginning and ending of rest period in apple and peach.** Bot. Gaz. 76: 167–184. *Fig. 1–7.* 1923.—The author's chemical studies were made on tips of 1-year-old seedling peaches and the tips and bark of 4-year-old Grimes apple trees. Determinations were made of moisture, reducing sugars, total sugars, starch, total carbohydrates, water-soluble pentosans and H-ion concentration. It was found that the inception and end of the rest period (not temperature-controlled dormant period) are "associated with changing relations in H-ion concentrations, carbohydrate content and the relative content of certain inorganic salts, particularly sulphates and phosphates." The author believes that the rest period may be changed through a modification of one or more of the factors above mentioned, but the particular modification best suited for the various crops will have to be worked out in specific instances.—*B. W. Wells.*

3926. Hesse, Otto. **Über die keimungsauslösende Wirkung chemischer Stoffe auf lichtempfindliche Samen.** [**Germination induction of light-sensitive seeds by chemicals.**] Ber. Deutsch. Bot. Ges. 41: 316–322. 1923.—It was not possible to differentiate light-sensitive seeds into acid types and N types by germination tests with different reagents. Germination of seeds in darkness was facilitated by nitrogen combinations and by a few acids, enzymes, and alcohol. Seed of *Verbascum thapsiforme* with intact seed coats showed increased germination after short treatment with acid. If the seed coat was broken the embryo was killed. Absolute alcohol did not injure the seeds tested if the seed coat was intact, but increased germination.—*Hally Jolivette Sax.*

3927. Wolff, Jules. **Conditions favorables ou nuisables à la germination des semences d'Orchidées et au développement des plantules.** [**Favorable and unfavorable conditions for the germination of orchid seeds and the development of their seedlings.**] Compt. Rend. Acad. Sci. Paris 177: 888–889. 1923.—The culture solution of Burgeff, modified by replacing the starch with 2½% glucose, was used. Germination without the fungus required a little longer than the normal 4–5 weeks. Seedlings without the fungus developed to the same size as infected ones, but had much less chlorophyll and were more feeble. It is therefore concluded that the endophyte has a beneficial effect upon the seedlings.—*C. H. Farr.*

TEMPERATURE RELATIONS

3928. Bartlett, C. J. **Does commercial pasteurization destroy tubercle bacilli in milk?** Amer. Jour. Public Health **13**: 807–809. 1923.—Pasteurization by the holding method between 142 and 148°F. for 30 minutes destroys the tubercle bacillus in milk. The relative frequency with which tubercle bacilli were found was greater in milk from the larger mixing vats than in that from the smaller mixing vats. [See also Bot. Absts. 13, Entry 3930.]—*C. A. Ludwig.*

3929. Dorsey, M. J., and P. D. Strausbaugh. **Plum investigations. 1. Winter injury to plum during dormancy.** Bot. Gaz. **76**: 113–143. *Pl. 10–11.* 1923.—The authors distinguish between the "fruit bud" or dormant winter bud and the "flower buds" which are enclosed by the scales of the fruit bud. They find the structure on which the flower buds are borne to be a foreshortened peduncle. The central part of this peduncle (pith core) furnishes a very sensitive index to hardiness. They find the pith core to be essentially a storage region, the storage materials consisting chiefly of proteins, fats and dextrin. The pH of the pith-core cells is 4.6. When all flower buds are killed on fruiting laterals which do not have leaf buds, such laterals are suppressed. The rate of thawing is believed to be as important a factor in killing as the rate of freezing. Killing in the flower buds occurred near midwinter each year at a time corresponding closely to the break in the rest period. In low temperature weather, ice does not form within the space about the flower buds. Cell studies show no disruption of the walls. The brown discoloration in the wood is interpreted as due to a "condensation of storage materials which apparently are thereby transformed into gums and tannins." In summary, the authors state: "Hardiness must be thought of in terms of a complex of causative factors all working together to enable the plant as an organism to resist low temperatures. Some of these factors may be best sought in the inheritance of the plant; others in the internal cell composition and structure; and still others in the environment of the plant." —*B. W. Wells.*

3930. Heulings, S. M. **Letter from S. M. Heulings.** Amer. Jour. Public Health **14**: 65. 1924.—Bartlett's conclusion [see Bot. Absts. 13, Entry 3928] is considered unwarranted by the data presented, for if the milk were pasteurized by the method mentioned it would be held for at least part of the time at temperature higher than 142°F.—*C. A. Ludwig.*

3931. Sears, H. J., and R. L. Benson. **Pathogenic Streptococci and milk pasteurization.** Amer. Jour. Public Health **13**: 937–940. 1923.—Streptococci enclosed in mucus, as is apt to be the case if milk becomes infected from human throats, are killed with greater difficulty by the pasteurization process than if not so enclosed. The same is probably true of Streptococci which gain access to the milk from an infected udder. A complete destruction of such pathogenic organisms by any treatment less than 145°F. for 30 minutes is quite uncertain.—*C. A. Ludwig.*

3932. Weimer, J. L., and L. L. Harter. **Temperature relations of eleven species of Rhizopus.** Jour. Agric. Res. **24**: 1–40. *23 fig.* 1923.—The influence of temperature on the spore germination, mycelial growth and fruiting was investigated in *Rhizopus nigricans*, *R. reflexus*, *R. chinensis*, *R. Tritici*, *R. Artocarpi*, *R. delemar*, *R. Maydis*, *R. nodosus*, *R. Oryzae*, *R. microsporus*, and *R. arrhizus*. The optimum for spore germination was higher for all species than for subsequent growth and fruiting, while in most cases the optimum for fruiting is about the same as for growth. In general the spores germinate at a temperature above the maximum for continued growth. The temperature at which the spores are produced influences somewhat their rate of germination and the early period of mycelial growth. Spores of *R. nigricans* germinated in a nutrient solution in a shorter time than in water. The rate of growth was not the same on all culture media tried. The addition of 20% dextrose to Irish-potato agar changed the cardinal temperatures of the strain of *R. nigricans* studied from 1 to 2°C. *R. Chinensis* has a temperature maximum and optimum several degrees higher than any of the other species. *R. nigricans*, *R. microsporus*. *R. reflexus*, and *R. Artocarpi* have a low optimum and maximum, while the 6 remaining species constitute an intermediate group.—*L. L. Harter.*

RADIANT ENERGY RELATIONS

3933. Petry, E. **Zur Kenntnis der Bedingungen der biologischen Wirkung der Röntgenstrahlen. [The biological action of X-rays.]** Biochem. Zeitschr. **119**: 23–44. 1921.—The effect of X-rays has a very low temperature coefficient (about 1) and thus falls in the same category as light reactions. Similarly, seedlings poisoned with KCN were no more sensitive to X-rays than those not poisoned. The relation of these results to the dynamics of respiration and nutrition is discussed. *Triticum* was used for these studies.—*Oran Raber.*

3934. Slosse, A. **Action chimique des rayons γ du radium. [The chemical action of the γ rays of radium.]** Compt. Rend. Soc. Biol. **89**: 96–98. 1923.—A glucose solution undergoes the following changes when submitted to the γ rays of radium: (1) rotatory power diminishes; (2) formaldehyde is formed; (3) its reducing power is diminished as shown by Fehling's solution. The 1st effect is explained by the formation of γ glucose from the β form. The formation of the formaldehyde may explain the action of radium in killing cancer tissue, the cells of which are generally rich in carbohydrates.—*Oran Raber.*

TOXIC AGENTS

3935. Bernard, S. **Influence de la lécithine sur l'action hémolysante de la saponine. [Influence of lecithin on the hemolytic action of saponin.]** Compt. Rend. Soc. Biol. **89**: 225–227. 1923.—Lecithin protects against the hemolytic action of saponin. This may explain the protective action of the blood in many pathogenic states as, e.g., in tuberculosis, since the serum of tubercular patients contains more than the normal amount of lecithin.—*Oran Raber.*

3936. Bohn, George, et Anna Drzewina. **Action toxique du rouge neutre en présence de la lumière. [Toxic action of neutral red in the presence of light.]** Compt. Rend. Soc. Biol. **89**: 386–388. 1923.—In 1 experiment neutral red (1 part to a million) caused total loss of fecundity of sea urchin sperm in 25 minutes. In another experiment fecundity was lost in the light in 1 hour while in the dark the sperms were still fertile at the end of 8 hours. Light alone in the absence of neutral red caused total loss of fecundity at the end of 8 hours. The same toxic effect was observed on infusorians, copepods, *Paramecium*, *Stylonichia*, and other forms.—*Oran Raber.*

3937. Borrel, A., L. Boez, et A. de Coulon. **Virulence du Bacille tuberculeux et toxicité de la tuberculine. [Virulence of B. tuberculosis and the toxicity of the tuberculin.]** Compt. Rend. Soc. Biol. **89**: 591–593. 1923.—Certain strains of *B. tuberculosis* transferred monthly for several years on glycerin-potato medium lost a large part of their initial virulence. This progressive attenuation is more common in strains from cattle than in human strains and is generally accompanied by a diminution of the toxicity of the tuberculin, but this relation is not constant. Certain strains of very little or no virulence continue to secrete a very active tuberculin.—*Oran Raber.*

3938. Brody, Louis, and Lloyd Arnold. **Variations in the limiting hydrogen-ion concentration of Streptococci.** Jour. Bact. **8**: 307–314. 1923.—The limiting H-ion concentration produced by Streptococci was determined for various hemolytic and viridans strains. The media used were Hiss-serum water and 1% Huntoon hormone bouillon, each with an initial pH of 7.45. Determinations were made after 24 hours' growth. In other experiments determinations were made after growing and transferring different strains at intervals of 2 days on Holman's meat medium and under various other conditions. The viridans strains were found to be less constant in their limiting H-ion concentration than the hemolytic strains. The limiting concentrations varied between pH 4.5 and 5.8.—*W. E. Maneval.*

3939. Duthoit, A. **De l'action sur différents microbes du chlorure de sodium à 9 p. 1.000. [The action on different bacteria of 0.9% NaCl.]** Compt. Rend. Soc. Biol. **89**: 548–550. *2 fig.* 1923.—Each bacterium has a specific death rate in this concentration of NaCl. *Staphylococcus* is the most resistant and *B. paratyphosus B* the least. All are dead within 24 hours. [See also following 2 entries.]—*Oran Raber.*

3940. Duthoit, A. **Action sur différents microbes, du chlorure de sodium à divers taux de concentration. [The effect on different bacteria of NaCl of different concentrations.]** Compt. Rend. Soc. Biol. **89**: 550–552. *1 fig.* 1923.—*Pneumobacillus*, *B. coli*, *B. typhosus*

B. paratyphosus, and *Staphylococcus aureus* were placed in solutions of NaCl of various concentrations. The optimum concentration for *S. aureus* was 0.5–1.0%; for *B. typhosus*, 1–2%; for *B. coli* and *B. paratyphosus B*, 2–3%; and for the Pneumobacillus, about 2%. [See also preceding and following entries.]—*Oran Raber.*

3941. Duthoit, A. **De l'action sur différents microbes, du chlorure de sodium seul ou associé à d'autres sels. [The effect on different bacteria of NaCl alone or associated with other salts.]** Compt. Rend. Soc. Biol. **89**: 553–554. *1 fig.* 1923.—NaCl alone practically sterilises the culture at the end of 7 hours. When 0.04% $CaCl_2$ is added the average life of the culture is extended to 12–48 hours. In Ringer's solution the cultures retain their vitality undiminished for days. [See also 2 preceding entries.]—*Oran Raber.*

3942. Hall, Ivan C., and Emelia Peterson. **The effect of certain bacteria upon the toxin production of Bacillus botulinus in vitro.** Jour. Bact. **8**: 319–341. 1923.—Botulinus toxin frequently developed in meat media inoculated with heated soils, human feces, and artificially inoculated soil cultures, while no toxin was demonstrated in media inoculated from the same materials, unheated. A number of organisms, especially those which form large amounts of acid, prevent or weaken botulinus-toxin production in sugar broth cultures. Acids alone do not have this effect. Pre-heating evidently killed organisms whose metabolic products, other than acids, inhibited the development of *B. botulinus* or its toxin.—*C. E. Skinner.*

3943. Joachimoglu, G. **Ein Vorlesungsversuch zur Demonstration der Abhängigkeit der antiseptischen Wirksamkeit der Hg-Verbindungen vom Dissoziationsgrade der Hg-Ionen. [A lecture experiment for demonstrating the dependence of antiseptic activity of mercury compounds upon the degree of dissociation.]** Biochem. Zeitschr. **121**: 259–261. *1 fig.* 1921.—Four fermentation tubes receive equal amounts of sugar solution, yeast, and $HgCl_2$ and are so diluted that the Hg concentration is 1 to 20,300 in the first pair, 1 to 18,950 in the 2nd pair. NaCl is added to 1 tube of each pair in sufficient amount to make the concentration 1 to 37. A 5th tube receives $Hg(CN)_2$ in concentration 1 to 19,830, and a 6th serves as a control. The tubes are allowed to stand 24 hours at room temperature and are then examined for the production of CO_2. No gas formation occurs in the tubes containing $HgCl_2$ alone. Those containing $HgCl_2$ and NaCl show considerable gas formation, the dissociation of the Hg being depressed by the NaCl present. $HgCN_2$ dissociates very slightly and the tube containing it shows gas formation approximately equal to that in the control.—*Joseph S. Caldwell.*

3944. Jodbauer, A., und F. Haffner. **Über den Zusammenhang von Dunkelwirkung fluorescierender Stoffe und Photodynamie auf Zellen. [The relation between the dark-action of fluorescent materials and photodynamic action in cells.]** Biochem. Zeitschr. **118**: 150–157. 1921.—Fluorescent materials and some not fluorescent in concentrations which at room temperature in the dark are not at all toxic, hasten markedly the hemolysis and flocculation of blood-corpuscle colloids in the dark. All the fluorescent materials which have a decided photodynamic action on cells produce the hemolysis and flocculation, but those which have no noticeable photodynamic action show no action in the dark. The action which occurs in the dark is a preliminary condition for the photodynamic action. The difference in photodynamic activity of materials of the same group depends not upon differences in their light sensitivity but upon differences in their capacity to react with the cell colloids.—*Oran Raber.*

3945. Kohho, Hugo. **Zur Kenntnis der Neutral-Salzwirkungen auf dem Pflanzenplasma. II. Mitteilung. [Action of neutral salts on plant protoplasm. II.]** Biochem. Zeitschr. **120**: 125–142. *1 fig.* 1921.—A large number of bits of red cabbage and *Tradescantia zebrina* epidermis were subjected to equinormal solutions of various salts of potassium, sodium, and ammonium for definite periods in darkness, the percentages of cells plasmolyzed and killed being counted. Less than ½ the cells showed coagulation after 10 hours submersion in 0.5 *N* potassium, ammonium, or sodium sulphate, citrate, or tartrate, while more than ½ the cells were dead after 3 hours in the corresponding chlorides and acetates or 2 hours in the nitrates and bromides. Ten minutes in iodides or cyanides killed very considerably more than ½ the cells. In 0.2 *N* solutions of the same salts the coagulating effect of sodium compounds was very much less than that of potassium and ammonium compounds having the same anions, thus indicating an additive effect in which the anion has greater significance than the cation. The order of the effectiveness of the anions is in good agreement with the lyotropic series and

remains constant whether the solutions be acid or alkaline. The rate of killing by a given salt is approximately 1.6 times as great in light as in darkness, as would be expected from existing knowledge of the effect upon permeability. Toxic effects of neutral salts are due to several factors, among which are the precipitation of lipoids and of proteins and the dehydration of biocolloids.—*Joseph S. Caldwell.*

3946. Kusonoki, Michio. **On the germicidal action of hydrosol of copper.** Jour. Biochem. Tokyo 3: 1–13. 1923.—The germicidal action of copper hydrosol is not due to colloidal copper particles, but to copper ions set free from copper carbonate and oxide formed as a result of contact of the solution with atmospheric gases. The dialysate from the copper sol was strongly bactericidal in action but this activity was annulled by treatment with H_2S. The dialysate obtained in an atmosphere of CO_2 was low in bactericidal power due to the formation of bicarbonate, but recovered its activity when air was bubbled through it. The explanation of the bactericidal action of copper hydrosol is therefore identical with that developed by the author for the action of silver hydrosol [see Bot. Absts. 12, Entry 6001].—*Joseph S. Caldwell.*

3947. Ramon, G. **Pouvoir floculant et pouvoir toxique de la toxine diphtérique. [The flocculating and toxic properties of diphtheria toxin.]** Compt. Rend. Soc. Biol. 89: 2–4. 1923. During the elaboration of the toxin in the bacterial culture, flocculating power and toxicity run parallel; afterwards the toxicity diminishes. The flocculating power is extremely stable and the toxicity very unstable. All the toxicity may be lost and the toxin will still show flocculation in the presence of antitoxin.—*Oran Raber.*

3948. Teschendorf, W. **Über die Gefässwirkung organischer Kationen und ihre Beeinflussung durch anorganische Ionen. [The action on tissues of organic cations and the influence of inorganic ions.]** Biochem. Zeitschr. 118: 267–285. *15 fig.* 1921.—A series of organic bases (as salts) were used on preparations of vascular tissue from the frog. Of these univalent organic cations acetylcholin had the greatest constricting power. Its action was observed in dilutions of 1 to a billion. Cholinmuscarin was much less effective and guanidin still less. Of the first 3 members in the quaternary ammonium base series (used as chlorides) tetramethylammoniumchloride showed great constricting power, standing between acetylcholin and cholinmuscarin. Tetraethylammoniumchloride behaved much like the guanidin and the tetrapropylammoniumchloride really lowered the vascular tonus. The 3 of the series thus show a wide variation in their action.—This constricting action of the organic cations can be reduced by bivalent inorganic cations in the order: Mg, Ca, Sr, Ba. If the tissue was perfused with $BaCl_2$ of low concentration for some time the action in the case of muscarin could be reversed. The action of the muscarin and acetylcholin could also be reversed if an excess of hydroxyl ions was added to the perfusing liquid.—*Oran Raber.*

3949. Traube, J., und R. Somogyi. **Zur Theorie der Desinfektion. [The theory of disinfection.]** Biochem. Zeitschr. 120: 90–99. 1921.—Experiments with *Bacterium coli* and *Staphylococcus* sp. are reported, in which a very large number of substances were tested for bactericidal power. *Bacterium coli* is less resistant to acids and more resistant to bases than *Staphylococcus*. The results, together with earlier work of the senior author, bear out the latter's previously published theory that disinfectants, in addition to direct chemical effects as acids or bases, exert also physical effects through adsorption, alteration of surface tension, change of electrical potential, water absorption, osmotic effects, or flocculation.—*Joseph S. Caldwell.*

ELECTRICITY AND MECHANICAL FORCES

3950. Lund, E. J. **Electrical control of organic polarity in the egg of Fucus.** Bot. Gaz. 67: 288–301. *Pl. 27, fig. 1–2.* 1923.—Fertilized Fucus eggs were allowed to attach themselves to a cover glass so oriented under sea water that a weak electric current could pass in a definite direction through them. It was found that the orientation of the primary spindle axis could be controlled. The author's summary follows: Polarity of the egg of Fucus can definitely be determined by applying a difference of electrical potential to the egg. Apparently this is the first egg, among either animals or plants, the polarity of which has been controlled by means of an electric current. The response of the Fucus egg to the electric cur-

rent in total darkness is similar to its response to light. A method is given for measuring the potential difference across a single egg which is placed in an electric current flowing in a stream of sea water of constant cross-section. The magnitude of the electrical potential applied to opposite sides of an egg, which is just able to cause orientation (threshold potential difference) of the axis of symmetry of the protoplasm of the Fucus egg, is 0.025 ± 0.002 volts. This threshold potential difference is definite and does not appear to involve any marked inhibitory effect (delay) upon growth. A potential difference of 0.036 volt applied to the egg does show an inhibitory effect (delay) upon cleavage. The establishment of an electrochemical polarity of some sort may possibly be a fundamentally associated condition for the development of the morphological polarity, because the physiological mechanism of the Fucus egg which determines morphological polarity can be controlled and directed by the application to the egg of a difference of electrical potential of external origin.—*B. W. Wells.*

3951. Mast, S. O. **Reaction to electricity in Volvox.** [Abstract.] Anat. Rec. **26**: 366. 1924.

3952. Michaelis, L., und Y. Airila. **Die elektrische Ladung des Hämoglobins.** [**The electrical charge of hemoglobin.**] Biochem. Zeitschr. **118**: 144–149. *1 fig.* 1921.—At pH 6.8, which is the isoelectric point, hemoglobin shows no cataphoresis. As the pH increases it moves toward the anode and as it decreases it moves toward the cathode, the speed varying with the rate of change of pH. The variation in the charge with the pH shows it to behave like an ordinary ampholyte.—*Oran Raber.*

MISCELLANEOUS

3953. Bishop, R. O. **Some factors affecting the rate of vulcanisation of plantation rubber.** Malayan Agric. Jour. **11**: 310–334. 1923.—Experiments are recorded showing variation in rate of vulcanisation of samples of rubber prepared by dropping latex into alcohol of variable H-ion concentration. Consideration of the results gives rise to the suggestion that it is the caoutchouc of raw rubber which is most intimately concerned in the changes taking place when the coagulum is "matured." It is thought probable that the caoutchouc forms oxidation products which exert a profound effect on its vulcanisation properties, in addition to the effect of the nitrogenous non-caoutchouc constituents of the latex.—*R. E. Holttum.*

3954. Fleury, Paul. **Reflexions sur la colorimétrie.** [**Notes on colorimetry.**] Bull. Soc. Chim. Biol. **4**: 223–232. 1922.—A discussion is presented of methods, limits of accuracy, and means of avoiding sources of error.—*Joseph S. Caldwell.*

3955. Garreau, Y. **À propos du colorimètre.** [**Concerning the colorimeter.**] Bull. Soc. Chim. Biol. **4**: 233–234. 1922.—In 743 colorimetric determinations of sugar by the picric acid method subsequently checked by chemical determinations, the range of error was 1.14 to 1.67 parts of sugar per 100, and in no case exceeded 5 parts per 100. The method is capable of a high degree of accuracy in the hands of an experienced operator.—*Joseph S. Caldwell.*

3956. Michaelis, L., und R. Krüger. **Weitere Ausarbeitung der Indikatorenmethode ohne Puffer.** [**Further improvement on the indicator method without buffers.**] Biochem. Zeitschr. **119**: 307–327. *1 fig.* 1921.—The temperature coefficient, the constants, and the salt error of *m*-nitrophenol are determined. The question as to what change in pH is caused by the addition of the indicator to the solution being examined is treated theoretically and practically, and directions are given for the colorimetric determinations of pH in solutions which are very poor in buffers, such as river water and sea water. The paper ends with a short discussion of salt error and the theory of ionic action.—*Oran Raber.*

3957. Schaede, Reinhold. **Über die Herstellung von Farbfiltern aus photographischen Platten.** [**Color filters from photographic plates.**] Ber. Deutsch. Bot. Ges. **41**: 343–344. 1923. —The author made color filters from old photographic plates. To obtain a blue filter he bathed a cleaned, washed, and dried plate for 2 hours in a 5% solution of $FeCl_3$. This was washed and placed in a 5% solution of $K_4Fe(CN)_6$ in which it turned blue; it was then washed and dried. For a yellow filter he used a 5% solution of Acridin III. This permits red and yellow to pass.—*Hally Jolivette Sax.*

SOIL SCIENCE

A. G. McCall, *Editor*

(See also in this issue Entries 3240, 3241, 3248, 3251, 3252, 3255, 3257, 3261, 3262, 3263, 3264, 3265, 3267, 3271, 3363, 3406, 3407, 3820, 3825, 3861, 3874)

3958. Agafonoff, V. **Étude comparative de quelques méthodes d'analyse chimique de l'humus dans les sols.** [Comparative study of certain methods in the chemical analysis of soil humus]. Compt. Rend. Acad. Sci. Paris 177: 404–406. 1923.—The following methods are compared in tabular form: the grill method; the method of Simon, by which the humus is oxidized with a mixture of silver bichromate and suphuric acid; the chromic acid method; and the chlorine method. In connection with the first 3 methods both the percent of humus and of carbon is given. The method of Simon and calcination by the grill give almost identical results. It is asserted that the method of Simon, checked by the chromic acid method, gives a good idea of the chemical nature of the humus.—*C. H. Farr.*

3959. Agafonoff, V. **Sur la limite d'accumulation de l'humus dans les sols, à propos d'observations sur des sols de la Nièvre.** [On the limit of the accumulation of humus in the soil, in connection with the observations on the soils of the Nièvre.] Compt. Rend. Acad. Sci. Paris 177: 828–830. 1923.—The soils studied were at least 2,000 years old, dating back prior to the Roman works in the vicinity. Samples were taken 300 m. west of the wall of the ruins, and a study was made of the distribution of the humus in the soil and subsoil.—*C. H. Farr.*

3960. Albrecht, W. A. **Nitrate accumulation under straw mulch.** Soil Sci. 14: 299–305. *2 fig.* 1922.—Results obtained from 1917 to 1919 show that mulching with straw keeps down the concentration of nitrates in the soil. The nitrate content of soil under mulch is far enough below that under crops as to suggest that mulching with straw is a practice to be used with care and discretion.—*W. J. Robbins.*

3961. Bouyoucos, George, and M. M. McCool. **A study of the causes of frost occurrence in muck soils.** Soil Sci. 14: 383–389. 1922.—When frost occurs in the growing season plants growing on muck and peat soils may be killed while plants growing on adjacent mineral soils may not be touched by the frost. This difference is due to the greater heat conductivity of the mineral soils, which allows the heat accumulated during the day to travel to the surface more quickly thus keeping the air above them warmer.—*W. J. Robbins.*

3962. Brown, Percy Edgar. **Soil experiment fields and their value.** Soil Sci. 14: 369–376. 1922.—This paper is a statement of the value of field experiments in general and of those of Iowa in particular.—*W. J. Robbins.*

3963. Demolon, A., et P. Boischot. **Sur l'activité des phénomènes biologiques dans la tourbe.** [On the activity of biologic phenomena in peat.] Compt. Rend. Acad. Sci. Paris 177: 282-284. 1923.—A study was made of the relationship of the CO_2 content of the soil to biologic activity. Fresh samples of peat were placed under uniform conditions of temperature, humidity, and aeration for 30 hours. From 10,000 to 25,000 aerobic micro-organisms per gm. were obtained. This relative paucity of soil organisms is attributed to the scant amount of phosphoric acid and other nutritive mineral elements present. The increase of CO_2 liberation as a result of partial sterilization with heat is not attributed to the destruction of toxins or to the action of protozoa, but to the chemical changes in the soil solution, which rendered the nutritive elements more easily available.—*C. H. Farr.*

3964. Erdman, L. W. **The sulfur content of rain water.** Soil Sci. 14: 363–367. 1922.—A total of 14.89 pounds of S was found in the annual precipitation at a station about 2 miles south of Ames, Iowa.—*W. J. Robbins.*

3965. Kahsnitz, Hans G. **Untersuchungen über den Einfluss der Regenwürmer auf Boden und Pflanze.** [Investigations on the influence of earth worms on soil and plant.] Bot. Archiv 1: 315–331. *Fig. 1–4.* 1922.—Plant yield increased in those pots containing earth worms in the case of all 3 plants experimented upon, namely, oats, peas, and mustard. Diseased conditions first appeared in those plants growing in a soil supplied with worms.—*William Seifriz.*

3966. Miyake, Koji, and Koji Nakamura. **On the effect of calcium oxide and calcium carbonate upon the decomposition of soybean cake and herring cake in two different soils.** Jour. Biochem. Tokyo 3: 27–54. 1923.—Soybean or herring cake, with varying quantities of CaO or $CaCO_3$ was mixed with 10-gm. samples of moist soil, and incubated at 30°C. in sealed flasks. The amount of CO_2 gas produced was determined weekly; the CO_2 present as carbonate in the soil was determined biweekly, and the organic carbon in the soil, at the termination of the experiment. With both $CaCO_3$ and CaO there was increased decomposition of organic matter; with $CaCO_3$ there was increased production of CO_2 gas, with CaO, an increase in the amount of carbonates in the soil. Both forms of lime increased the rates of ammonification and nitrification in a degree proportional to the amount added, but the effect of CaO was less pronounced. The decomposition of carbon compounds was greatest with CaO, greater increase being found in the acid soil. Practically twice as much decomposition of carbon compounds occurred during the ammonification of a given amount of organic nitrogen from a given source in the acid soil as in the loam soil In the ammonification of a given quantity of organic nitrogen, 1½ times as much organic carbon was set free as CO_2 from herring cake as from soybean cake.—*Joseph S. Caldwell.*

3967. Piettre, Maurice. **L'humus dans les terres à café, au Brésil. [The humus of the coffee plantations of Brazil.]** Compt. Rend. Acad. Sci. Paris. **177:** 139–141. 1923.—The accumulation of fertilizing mineral materials (CaO, P_2O_5, MgO, KOH, etc.) and of humus in the virgin forest greatly favors the fixation and immobilization of the minerals by the humus. The organo-mineral fertility should not be destroyed through burning when the forest is cut down, as is the practice in Brazil, but should be conserved by working it at once into the subsoil even at considerable expense.—*C. H. Farr.*

3968. Piettre, Maurice. **Relations chimiques entre les matières humiques et la houille. [The chemical relations between humic materials and coal.]** Compt. Rend. Acad. Sci. Paris **177:** 486–488. 1923.—The amount of humic material is determined by the pyridine method. By a comparison of the soils and peats of Brazil, America, Cardiff, and Elsecar it is concluded that humus, peat, and coal have a common origin.—*C. H. Farr.*

3969. Powers, W. L. **Some ways of increasing the duty of irrigation water.** Soil Sci. **14:** 377–382. *2 fig.* 1922.—This paper discusses the moisture capacity of the soil, rotations, manure and fertility in their relation to the amount of water required to produce a crop under irrigation conditions.—*W. J. Robbins.*

3970. Ramann, E. **"Pufferwirkungen" der sauren Kohlensauren Salze und ihre Bedeutung für Waldböden. [The buffer action of acid carbonates and their significance for forest soils.]** Zeitschr. Forst.- u. Jagdw. **54:** 4–11. 1922.—Recent investigations of Ramann and Junk (Deutsch. Landw. Presse **48:** 612–613. 1921) demonstrate that free carbonic acid vigorously attacks silicates and decomposes them with the liberation of their bases; but, in the presence of acid carbonates, such as $Ca(HCO_3)_2$, the action of carbonic acid is diminished or even practically inhibited. The bicarbonates thus act as buffers to the free carbonic acid. Under natural conditions, as in forest soils, the decomposition of silicates by free carbonic acid in the presence of abundant soil moisture results in the solution of valuable alkalies and their loss by leaching, unless the reaction is hindered by the presence of even small amounts of bicarbonates. Thus, in this respect, $Ca(HCO_3)_2$ directly and $CaCO_3$ indirectly, are regulators of soil fertility. The continued removal of litter from forest floors, containing acid carbonates arising from decomposition of plant remains, indirectly deprives the soil of considerably more mineral constituents than correspond to the absolute quantity in the salvaged litter.—*P. D. Dawson.*

3971. Rudolfs, W. **Influence of sulfur oxidation upon growth of soybeans and its effect on bacterial flora of soil.** Soil Sci. **14:** 247–263. *1 pl. 2 fig.* 1922.—Pot experiments showed that the growth rate and nodule formation of soybean plants grown in soil treated with inoculated sulphur were stimulated by small additions of sulphur, but were injured by larger additions. Sulphur with acid phosphate in addition produced the best soybean plants. In sand cultures if sufficient acidity was produced to make the phosphorus of Florida soft rock phosphate available the plants were killed. The flora of these soils was stimulated by small additions of suphur but depressed by larger ones—*W. J. Robbins.*

3972. Rudolfs, W. **Sulfur oxidation in inoculated and uninoculated greensand mixtures and its relation to the availability of potassium.** Soil Sci. 14: 307–319. *1 pl., 1 fig.* 1922.—In composts of greensand and sulphur small amounts of potassium are liberated. The potassium of the greensand is made available at a pH of 2.7–2.3. Soy bean plants grown in sand moistened with a nutrient solution lacking potassium made as great a dry weight of tops when supplied with composted greensand as when potassium phosphate was used.—*W. J. Robbins.*

3973. Schollenberger, C. J. **Silica and silicates in relation to plant growth and composition.** Soil Sci. 14: 347–362. 1922.—Silica added as air-dry hydrated silica plus dialyzed silica, blast furnace slag, calcium silicate, and sodium silicate in the order named increased the percentage of silica in soybeans, oats, and buckwheat. Pots treated with various silica compounds and soluble phosphates furnished no evidnnce of the action of silica in phosphorus uptake. Where the soil was the sole source of phosphorus the plants in pots receiving silica compounds and $CaCO_3$ yielded more and had a higher phosphorus content than in pots receiving $CaCO_3$ alone. In soils to which slag, calcium silicate and carbonate were added the soybeans showed a relation between silica added and phosphorus utilization. The application of silica to wheat, however, did not increase the phosphorus absorption.—*W. J. Robbins.*

3974. Shedd, O. M. **Effect of certain calcium compounds and other substances on the yield and calcium content of some crops.** Soil Sci. 14: 233–246. 1922.—Pot experiments were performed on 4 types of Kentucky soils to determine whether calcium, as a plant food, was deficient. Soybeans, sweet clover, alfalfa and oats were grown in rotation. In some instances the addition of calcium salts increased the yield. The calcium treatments increased the ash and calcium content of the crops and in some instances the yield. Silica treatments increased the yield of soybeans and oats on some soils, while the application of magnesium silicate decreased the calcium content of the crops.—*W. J. Robbins.*

3975. Van Alstine, E. **Calcined phosphatic limestone as a fertilizer.** Soil Sci. 14: 265–281. *1 pl.* 1922.—Burned and hydrated phosphatic limestone is considerably inferior to acid phosphate as a fertilizer in both soil and sand cultures. The advantage of burned and hydrated phosphatic limestone over raw phosphatic rock is slight.—*W. J. Robbins.*

3976. Waksman, Selman A. **Microbiological analysis of soil as an index of soil fertility: II. Methods of the study of the numbers of micro-organisms in the soil.** Soil Sci. 14: 283–298. 1922.—A medium of standard composition, containing no material such as peptone or meat extract which may vary greatly in composition, should be used. The reaction should be pH 6.5. Directions are given for making the dilutions, preparing the plates, and incubating the samples. The probable error should not be greater than 2.0–2.5% for each soil and not above 3.0% for each soil sample.—*W. J. Robbins.*

3977. Waksman, Selman A. **Microbiological analysis of soil as an index of soil fertility: III. Influence of fertilization upon numbers of micro-organisms in the soil.** Soil Sci. 14: 321–346. *2 fig.* 1922.—Potassium salts and phosphates, especially in the presence of lime, stimulated the development of microorganisms in the soil. The addition of lime increased the number of bacteria and actinomycetes but decreased the number of fungi. $NaNO_3$ increased the bacteria and actinomycetes but not the fungi. $(NH_4)_2SO_4$ stimulated fungi but not the other 2 groups, while manure stimulated all 3 groups. Crop production paralleled the numbers of microorganisms.—*W. J. Robbins.*

3978. Waksman, Selman A., Clara H. Wark, Jacob S. Joffe, and Robert L. Starkey. **Oxidation of sulfur by micro-organisms in black alkali soils.** Jour. Agric. Res. 24: 297–305. 1923.—Two organisms, previously reported, were isolated which oxidize S to H_2SO_4 in black alkali soils: one, *Thiobacillus thiooxidans* Waksman and Joffe, very active under acid conditions, and the other a form related to *Thiobacillus thioparus* Beijerinck, active under alkaline conditions. The acid formed in the oxidation of S caused the disappearance of the carbonates and bicarbonates. The acidity increased with increase in the amounts of S added and where the S was in contact with the soil for long periods of time. The reaction of the soil can be lowered from pH 9.6 to 3.5, if sufficient S is added. Crude cultures were more effective in S oxidation than pure cultures, suggesting that more than 1 sulfur oxidizing organism is active in the process. Saprophytic bacteria developed in much greater numbers in soils where the pH was reduced by S oxidation.—*R. L. Starkey.*

TAXONOMY OF VASCULAR PLANTS

J. M. Greenman, *Editor*

E. B. Payson, *Assistant Editor*

(See also in this issue Entries 3383, 3399, 3400, 3404, 3459, 3480, 3583, 3911.)

GENERAL

3979. Anonymous. [Rev. of: Babington, Charles Cardale. **Manual of British botany containing the flowering plants and ferns, arranged according to the natural orders.** *10th ed.*, with amended nomenclature and an appendix edited by A. J. Wilmott. *612 p.* Gurney & Jackson: London, 1922.] Jour. Bot. **60**: 240–243. 1922. [See also Bot. Absts. 13, Entry 527.]

3980. Alexnat, Walter. **Sero-diagnostische Untersuchungen über die Verwandtschaftsverhältnisse innerhalb der Sympetalen. [Serum diagnoses of relationships within the Sympetalae.]** Bot. Archiv. **1**: 129–154. *1 fig.* 1922.—Serum diagnoses of the albumin relationships within the Sympetalae support Engler's conception of the phylogeny of this group.—*William Seifriz.*

3981. Almquist, Ernst. **Linnaean species in our days.** Jour. Bot. **60**: 292–296. 1922. —The author points out that Linnaeus recognized that a species might possess constant characters that do not change with environment or it might be a collective species, and that varieties might be classed into 2 groups,—those with constant characters and those which go back to the common form by culture. This last group he called "varietates ex loco." A comparison is made between some of these ideas with those of Darwin and Mendel along the same or similar lines.—*Adele Lewis Grant.*

3982. Barnhart, John Hendley. **Plant nomenclature.** Jour. Bot. **60**: 256–263, 300–301. 1922.—The author considers each of the 17 proposed changes of the Vienna Rules made by Mr. Sprague [see Bot. Absts. 10, Entry 810]. Each suggestion in these proposed changes is discussed and the reasons given for the author's own opinion.—*Adele Lewis Grant.*

3983. Hitchcock, A. S. **Plant nomenclature.** Jour. Bot. **60**: 111–112. 1922.—The author discusses what is meant by a concept of types and suggests that the International Rules be altered so as to apply the type concept retroactively.—*Adele Lewis Grant.*

3984. Hitchcock, A. S. **Sodiro herbarium.** Science **58**: 465. 1923.—The Colegio de San Gabriel in Quito, Ecuador, has this large herbarium of Andean plants and duplicates are being sold.—*C. J. Lyon.*

3985. Hoeffgen, Franz. **Sero-diagnostische Untersuchungen über die Verwandtschaftsverhältnisse innerhalb des Columniferen-Astes der Dicotylen. [Investigations in serum diagnosis of relationships within the Columniferae branch of the dicotyledons.]** Bot. Archiv **1**: 81–99. *1 fig.* 1922.—On the basis of serum reactions the author concludes that Wettstein's hypothesis that the Tricoccae (namely, the Euphorbiaceae) are the most primitive of the Disciflorae, does not hold. One must regard the simple floral structure occurring within the Euphorbiaceae as a retrogression; that is, the corolla type of the Tricoccae is the starting point of the series from which the simpler of the Euphorbiacious flowers have phylogenetically arisen by reduction. The Tricoccae are thus removed from the bottom of the Disciflorae.—*William Seifriz.*

3986. Kops, Jan, F. W. van Eeden, en L. Vuyck. **Flora Batava. Afbeelding en Beschrijving der Nederlandsche Gewassen. [Flora of Batavia. Illustrations and descriptions of plants of Holland.]** 414e–417e Aflevering. *Pl. 2049–2064.* Martinus Nijhoff: 's-Gravenhage, 1923.—The vascular plants described and illustrated in the present parts are: *Rubus pallidus* Whe. & N., *R. argenteus* Whe. & N., *Abutilon Avicennae* Gaertn., *Viscaria vulgaris* Roehl., *Sporobolus indicus* R. Br., *Amarantus crispus* Braun, *Medicago murex* Willd., and *Dracocephalum parviflorum* Nutt. The non-vascular plants included are: *Lamprospora miniata* De Not., *Eccilia cancrina* Fr., *E. rusticoides* Gill., *Ustularia vulgaris* Tul., *Boletus appendiculatus* Schaeff., *Clavaria Ligula* Schaeff., *C. similis* Boud. & Pat., *C. fuscata* Oud., *Amanita spissa* Fr., *Panaeolus acuminatus* Fr., *Psathyrella prona* Fr., *Pluteus chrysophaeus* Schaeff., *and P. nanus* P.—*J. M. Greenman.*

3987. Malligson, Felix. **Sero-diagnostische Untersuchungen über die Verwandtschaften innerhalb des Centrospermen-Astes des Pflanzenreichs. [Serum diagnoses of relationships within the Centrosperm branch of the plant kingdom.]** Bot. Archiv 1: 2–20. *1 fig.* 1922.—The Centrosperm branch of the plant kingdom includes all essential families of the Monochlamydeae. If the Hamamelidales and Tricoccae, which give no serum reaction with the remaining Monochlamydeae, are taken out of this large group, there remains a unified series of families. The families Plumbaginaceae, Primulaceae, Myrsinaceae, Theophrastaceae and Lentibulariaceae, grouped as Primulales, are serologically connected to the true Centrosperm branch; thus is the former uncertainty of the genetical relationship of these families to the Centrospermae fully cleared up.—*William Seifriz.*

3988. Oga, I. **Flora of Chienshan.** Light of Manchuria **1921**: 14–45. 1921.—A descriptive account of the Chienshan Mountains of Manchuria is given, and the plants, particularly those occurring about the several temples, are recorded. There is also included a list of the medicinal plants of Chienshan. In all cases the native name is associated with the scientific name of the plant.—*J. M. Greenman.*

3989. Pennell, Francis W. **Plant nomenclature.** Jour. Bot. **60**: 112–118. 1922.—The questions of the principle of types and *nomina conservanda* are treated in some detail under the headings of (1) Stability of names and (2) Accuracy and applicability of names. This is mainly an answer to Mr. Sprague's discussion [see Bot. Absts. 10, Entry 810]. Pennell suggests several compromises between the American Code and the International Rules, the chief of which refer to the retention as "nomina conservanda" of antedated current names of genera containing 100 or 50 species, the rejection of untypified generic names and homonyms, and the adoption of definite rules for the selection of types. [See also following entry.]—*Adele Lewis Grant.*

3990. Sprague, T. A. **Plant nomenclature: a reply.** Jour. Bot. **60**: 129–139. 1922.—This is mainly a reply to F. W. Pennell [see preceding Entry] and is arranged under 3 headings: (1) Name-changes required under the American Code. The author does not agree with Pennell that there would be a much smaller number of changes in nomenclature if the modifications of the American Code procedure, as suggested by Pennell, were adopted. (2) Generic homonyms. It is suggested that instead of treating all generic homonyms as invalid, that such generic homonyms as are in current use be placed on the list of "nomina conservanda" and the remainder treated as invalid. (3) Typification of genera. Following Hitchcock's suggestion, the author supports the proposal for the appointment of an International Committee for the purpose of fixing generic types and "substitute types," recommending new "nomina conservanda," etc. The remainder of the article is concerned with a discussion of the 12 suggestions made for amendments to the present International Rules [see Bot. Absts. 10, Entry 810.]—*Adele Lewis Grant.*

3991. Thurston, Edgar, and Chambré C. Vigurs. **A supplement to F. Hamilton Davey's Flora of Cornwall.** *8vo, xx + 172 p., frontispiece.* Oscar Blackford: Truro, England, 1922. [Reprinted from Jour. Roy. Inst. Cornwall Vol. 21.]—In the present work are incorporated the numerous additions which have resulted from an intensive study of the plants of the region involved since the publication of the Flora of Cornwall in 1909. An analysis of the additions, corrections, and new records concern more than 300 species, varieties, forms, and hybrids of vascular plants including also the Characeae.—*J. M. Greenman.*

3992. Wilmott, A. J. **Some remarks on nomenclature.** Jour. Bot. **60**: 196–201. 1922. —This a discussion of the British plant names found in the nomenclatural notes by Schinz and Thellung [see Bot. Absts. 12, Entry 3603]. Two new combinations are made: *Dibothrospermum agreste* Knaf is transferred to *Matricaria* as *M. maritima* L. var. *agrestis*, and *Panicum Ischaemum* Schreber becomes *Digitaria Ischaemum*.—The author offers the following suggestions in regard to the much discussed question of nomenclature: (1) the type method would lead to precision and simplification; (2) Latin must remain unless all agree to Latin, French, English or German; (3) duplication of names should be allowed; (4) misleading geographical names should be retained as they are few and it would be difficult to draw a deciding line; (5) all non-binomial books and (6) all homonyms should be rejected.—*Adele Lewis Grant.*

SPERMATOPHYTES

3993. Britten, James. [Rev. of: Merrill, Elmer D. **A review of the new species of plants proposed by N. L. Burman in his Flora Indica.** Philippine Jour. Sci. **19**: 329–388. 1921 (see Bot. Absts. 11, Entry 3223).] Jour. Bot. **60**: 210–212. 1922.

3994. Budnowski, Arthur. **Die Septaldrüsen der Bromeliaceen. [The septal glands of the Bromeliads.]** Bot. Archiv. **1**: 47–80, 101–105. *3 fig.* 1922.—The relationship of the Bromeliades, based on the morphology of their ovarian glands, is discussed. While *Bromelia, Fascicularia,* and *Deinacanthon* possess a definite closed type of gland, the genera *Greigia, Cryptanthus* and *Cryptanthepsis* are distinct from them and take a special position within the Archaeobromeliae.—*William Seifriz.*

3995. Camus, E. G., et A. Camus. **Graminées.** [Gramineae.] In: Lecomte, H. Flore générale de l'Indo-Chine **7**: 202–480. *Fig. 30–40.* 1022; 481–650. *Fig. 41–48.* 1923.—The grasses of Indo China are described with keys to tribes, genera and species. The classification is in the main that of Hackel in Engler & Prantl's Pflanzenfamilien. The tribe *Phareae* Stapf is segregated from *Oryzeae*; and *Phleoideae* (here proposed) and *Sporoboleae* Stapf are segregated from *Agrostideae.* Specimens are cited and vernacular names and uses are given. New genera, species, and names by A. Camus are: *Sclerostachya* (Saccharum Sect. Andersson in Hackel); *Erianthus longifolius* (*Saccharum longifolium* Munro); *Microstegium vimineum* var. *Willdenowiana* (*Microstegium Willdenowianum* Nees); *Ischaemum aristatum* L. var. *imbricatum* (*I. aristatum* subsp. *imberbe* var. *imbricatum* Hack.), *I. aristatum* var. *fallax* (*I. aristatum* subsp. *imberbe* var. *fallax* Hack.), *I. aristatum* var. *Meyenianum* (*Meoschium Meyenianum* Nees), *I. aristatum* var. *lodiculare* (*Meoschium lodiculare* Nees), *I. aristatum* var. *elatum* (*Meoschium elatum* Nees); *Arthraxon ciliaris* P. Br. var. *Quartinianus* (*Alectoridia Quartiniana* Rich.); *Amphilophis pertusa* Stapf var. *barbata* (*Andropogon pertusus* var. *barbatus* A. Cam.), *A. glabra* Stapf var. *Haenkei* (*Andropogon Haenkei* Presl); *Capillipedium assimile* (*Andropogon assimilis* Steud.); *Dichanthium caricosum* (*Andropogon caricosus* L.); *Sorghum affine* (*Andropogon affinis* Presl), *S. mekongense* (*S. halepense* var. *mekongense* A. Cam.), *S. serratum* Stapf var. *nitidum* (*Holcus nitidus* Vahl); *Vetiveria nemoralis* (*Andropogon nemoralis* Bal.); *Chrysopogon orientalis* (*Rhaphis orientalis* Desv.); *Cymbopogon caesius* Stapf var. *gracillimus* (*Andropogon Schoenanthus* var. *gracillimus* Hook.), *C. cambodgiensis* (*Andropogon cambodgiensis* Bal.); *Themeda arundinacea* (*Anthistiria arundinacea* Roxb.), *T. arundinacea* var. *subsericans* (*Anthistiria subsericans* Nees), *T. villosa* (*Anthistiria villosa* Poir.), *T. villosa* var. *sundaica* (*Androscepia gigantea* var. *sundaica* Büse), *T. caudata* (*Anthistiria caudata* Nees); *Hemarthria longiflora* Hook var. *tonkinensis* (*Rottboellia tonkinensis* A. Cam.); *Digitaria marginata* Link var. *extensa* (*Panicum extensum* Nees), *D. subcorymbosa* (*Paspalum subcorymbosum* A. Cam.); *Paspalidium flavidum* (*Panicum flavidum* Retz.), *P. punctatum* (*Panicum punctatum* Burm.); *Brachiaria ambigua* (*Panicum ambiguum* Trin.), *B. villosa* (*Panicum villosum* Lam.), *B. distachya* (*Panicum distachyum* L.), *B. distachya* var. *brevifolia* (*Panicum distachyum* var. *brevifolium* Wight & Arn.), *B. Kurzii* (*Panicum Kurzii* Hook.); *Hemigymnia Arnottiana* Stapf var. *micrantha* (*Panicum nodosum* var. *micranthum* Bal.); *Sacciolepis polymorpha* A. Chase var. *angustifolia* (*Panicum polymorpha* var. *angustifolia* A. Cam.), *S. polymorpha* var. *micrantha* (*Hymenachne polymorpha* var. *micrantha* Bal.), *S. polymorpha* var. *grandis* (*Hymenachne polymorpha* var. *grandis* Bal.), *S. polymorpha* var. *densa* (*Panicum polymorphum* var. *densum* A. Cam.), *S. aurita* (*Panicum auritum* Presl); *Cyrtococcum patens* A. Cam. var. *Schmidtii* (*Panicum Schmidtii* Hack.); *Setaria lutescens* Hubbard var. *parviflora* (*S. glauca* var. *parviflora* Munro); *Chamaeraphis Brunoniana* (*Panicum Brunonianum* Wall. & Griff.); *Eustachys obtusifolia* (*Chloris obtusifolia* Bal.); *Elytrophorus spicatus* (*Dactylis spicata* Willd.); *Arundo madagascariensis* Kunth var. *Zollingeri* (*Neyraudia madagascarensis* var. *Zollingeri* Hook.); *Eragrostis amabilis* Wight & Arn.? var. *tenella* (*Poa tenella* L.), *E. amabilis* var *plumosa* (*Poa plumosa* Retz.), *E. amabilis* var. *riparia* (*Poa riparia* Willd.), *E. amabilis* var. *breviculmis* (*E. tenella* var. *breviculmis* Stapf); *Diplachne Petelotii; Oxytenanthera dinhensis, O. tenuispiculata.*—*A. Chase.*

3996. Dallimore, W., and A. Bruce Jackson. **A handbook of Coniferae including Ginkgoaceae.** Roy. *8vo, xi + 570 p., 31 pl., 120 fig., frontispiece.* Longmans, Green & Co.: New York; Edward Arnold & Co.: London, 1923.—The authors have endeavored to include in the

present volume all known species of conifers. A synopsis of the families and tribes and a key to the genera in cultivation precedes the characterization of species. The descriptions are clear and not over technical. Numerous synonyms as well as common names are cited, and a very limited bibliography is given. Copious illustrations accompany the text.—*J. M. Greenman.*

3997. Davidson, A. **New botanical species from Southern California.** Bull. Southern California Acad. Sci. 21: 39–41. *Pl. 2.* 1922.—*Langloisia flaviflora, Allium tenellum,* and *Fritillaria ojaiensis* are described as new.—*Roxana Stinchfield Ferris.*

3998. Feddersen, P. **Notes on the orchids of Johore.** Singapore Nat. 2. *80–85.* 1923. —Notes are given on the localities and nature of the habitats of 56 species, and in some cases also morphological notes. A new record is a *Cypripedium* considered to be *C. Wolterianum* Kraenzl.—*R. E. Holttum.*

3999. Greenman, J. M. **Studies of South American Senecios I.** Ann. Missouri Bot. Gard. 10: 73–110. *Pl. 3–8.* Sept. 28, 1923.—Fifty-six species, 1 form and 1 variety of *Senecio* are listed. Of these the following are described as new: *Senecio aberrans,* S. *aridus, S. Buchtienii, S. chaquiroensis, S. genuflexus, S. lophophilus, S. Pennellii, S. Pennellii* var. *gachetensis, S. pericaulis, S. sanctae-martae, S. scortifolius, S. subglomerosus,* and *S. sylvicolus.* The new combinations proposed are *Senecio alternifolius* (*Gynoxis alternifolia* Schz. Bip), *S. arboreus* (*Cacalia arborea* HBK.), and *S. subruncinatus* (*S. formosus* var. *subruncinatus* Wedd.).—*S. M. Zeller.*

4000. Griffiths, B. Millard. **Growth experiments on Spergula and Plantago.** Jour. Bot. 60: 228–230. 1922.—At University College, Reading, an armful of plants of corn spurrey growing in one place in an oat field were pulled up and the seed shaken out. The latter were of 2 kinds, those with smooth testas and those with mealy testas. These were separated and planted the following year in separate plots. The mealy seed gave rise to robust, sticky plants which bore the same kinds of seed while the smooth seed produced more delicate plants, scarcely sticky, and with smooth-skinned seed. The conclusion is drawn that the 2 are distinct species that do not hybridize.—Seed of typical *Plantago lanceolata,* of the typical variety *sphaerostachya,* and of intermediates between the 2, were grown under the same conditions and all resulted in typical *P. lanceolata* plants. Seed from the large typical form were sown in a shallow earthenware dish under unfavorable conditions and small narrow leaved specimens resembling the var. *sphaerostachya* developed, indicating that this variety of *P. lanceolata* is due to ecological conditions. Similar experiments were carried on with the normal *P. major* and a large leaved form. The results indicated that the large form is a recessive to the normal form.—*Adele Lewis Grant.*

4001. Jepson, W. L. **A new species of Eriogonum from California.** Madroño 1: 115, 116. 1923.—*Eriogonum bidentatum,* a species allied to *E. angulosum* Benth., from Taft, Kern County, is described as new.—*Roxana Stinchfield Ferris.*

4002. Mez, Carl. **Abromeitia, Myrsinacearum novum genus describitur auctore. [Abromeitia a new genus of the Myrsinaceae.]** Bot. Archiv 1: 100. 1922.—*A. Pterocarpa* is described.—*William Seifriz.*

4003. Mez, Carl. **Fittingia, novum Myrsinacearum genus. [Fittingia, a new Myrsinaceae genus.]** Bot. Archiv 1: 105–106. 1922.—*F. tubiflora and F. urceolata* are described.—*William Seifriz.*

4004. Norman, Cecil. **New Umbelliferae from tropical Africa.** Jour. Bot. 60: 118–120. 1922.—The following species are described as new, all from the collection of John Gossweiler, made in Portuguese West Africa: *Carum angolense, Selinum angolense, Pimpinella robusta, Peucedanum Gossweileri,* and *Annesorhiza Gossweileri.—Adele Lewis Grant.*

4005. Norman, Cecil. **On Cotylonia, a new genus of Umbelliferae.** Jour. Bot. 60: 166–167. *1 fig.* 1922.—The new genus is closely related to *Hydrocotyle* and *Micropleura.* It is based on a single species, *C. bracteata,* recently collected in China.—*Adele Lewis Grant.*

4006. Pugsley, B. A. **A spineless variety of Genista anglica L.** Jour. Bot. 60: 201–203. 1922.—The author agrees with Rouy and Foucaud that the prostrate spineless form of *Genista anglica* should be considered as *G. anglica* var. *subinermis* Rouy & Fouc. This variety occurs in various parts of Scotland.—*Adele Lewis Grant.*

4007. Ridley, H. N. **Sandoricum koetjape and Dendrobium caninum.** Jour. Bot. **60:** 273–274. 1922.—The author gives his reasons for not agreeing with Merrill as to those new combinations for the plants formerly known as *Sandoricum indicum* Cav. and *Dendrobium crumenatum* Sw. These new combinations were made in Merrill's "Review of new species proposed by N. L. Burman in his Flora Indica" [see Bot. Absts. 11, Entry 3223.]—*Adele Lewis Grant.*

4008. Schallert, P. O. **Notes on a new rose-flowered Robinia from South Carolina.** Torreya **23:** 104–105. 1923.—*Robinia Ashei* sp. nov., from Oconee County, South Carolina, is described. The species resembles *R. longiloba* Ashe, but is distinguished by the longer racemes, much longer calyx-lobes, and greater pubescence.—*J. C. Nelson.*

4009. Schnellenberg, Gustav. **Die systematische Gliederung der Gramineen. [Systematic organization of the Gramineae.]** Bot. Archiv **1:** 257–260. *1 fig.* 1922.—The author presents a family tree of the grasses which is a modification of that of Bessey.—*William Seifriz.*

4010. Schnellenberg, Gustav. **Pseudellipanthus, genus novum Connaracearum. [Pseudellipanthus, a new genus of Connaraceae.]** Bot. Archiv **1:** 314–315. 1922.—Two species, *P. Beccarii* and *P. peltatus,* formerly of the genus *Ellipanthus,* are described.—*William Seifriz.*

4011. Sherff, Earl Edward. **Studies in the Genus Bidens. VI.** Bot. Gaz. **76:** 144–166. *Pl. 12–14.* 1923.—The following new species are presented: *Bidens amoena, B. rupestris, B. Whytei, B. Schlechteri, B. Hoffmannii, B. acutiloba, B. kamerunensis, B. palustris, B. spathulata, B. Buchtienii, B. pseudocosmos, B. phalangiphylla, B. conjuncta, B. waimeana, B. Henryi, B. Ahnnei, B. paupercula, B. graciloides, B. diversa.* The following new combinations are made: *Bidens connata* Muhl. var. *fallax* (Warnst.), *B. crataegifolia* (O. Hoffm.), *B. Fischeri* (O. Hoffm.), *B. Stuhlmannii* (O. Hoffm.), *B. Buchneri* (Klatt), *B. Sereti* (De Wild.), *B. ochracea* (O. Hoffm.). Notes on synonomy of the following are given: *Bidens pilosa* L., *B. triplinervia* HBK., *B. heterophylla* Ortega, *B. alausensis* HBK., *B. involucrata* (Nutt.) Britt., *B. sandvicensis* Less. Amplified descriptions are given of *Bidens sandvicensis* Less., and *B. Sereti* (De Wild.).—*B. W. Wells.*

4012. Sprague, T. A. **Bibliographical notes. LXXXVI. Grauer's 'Decuria.'** Jour. Bot. **60:** 267–272. 1922.—Descriptions of the 10 species of plants proposed by Grauer as new, in the Decuria, published in 1784, are reprinted. Comments are added by the author and others as to the place of these in our present knowledge of the species under consideration. One new combination is made by W. B. Turrill, in which *Clypeola echinata* DC. becomes *C. aspera* (*Peltaria aspera* Grauer), the latter name being the older.—*Adele Lewis Grant.*

4013. Sprague, T. A. **The type-species of Bignonia.** Jour. Bot. **60:** 236–238. 1922.—*Bignonia,* as defined by Linnaeus in 1753–4, included species belonging to 15 genera. There has been considerable diversity of opinion as to the type species and the present author believes that there is no doubt that *B. capreolata* L. (*Anisostichus capreolatus*) is to be considered the type. Tournefort originally described *Bignonia,* and the type should be selected from the species common to Tournefort's Elemens and the 1st edition of the Species Plantarum. These are *B. unguis-cati, aequinoctialis, capreolata, radicans* and *indica.* Linnaeus cited Tournefort's plate and *B. capreolata* was the species figured. It should therefore be accepted as the type-species, Sprague concludes. The synonymy of *Bignonia* and of *Doxantha* is added.—*Adele Lewis Grant.*

4014. [Stephenson], T., and T. A. S[tephenson]. [Rev. of: Camus, E. C., et A. Camus. **Iconographie des Orchidées d'Europe et du Bassin Mediterranéen. [Illustrations of the orchids of Europe and the Mediterranean basin.]** *Folio atlas, pl. 122, with an explanatory handbook.* Paul Lechavalier: Paris, 1921 (see Bot. Absts. 12, Entry 6066).] Jour. Bot. **50:** 124–125. 1922.

4015. Suksdorf, Wilhelm [N]. **A new saxifrage from Oregon.** Torreya **23:** 106–107. 1923.—*Saxifraga Gormani* sp. nov. from Multnomah County, Oregon, is described. The species resembles *S. fragosa* Suksd., but differs in the more adnate calyx with narrower lobes, prominently 3-nerved sessile petals, subulate slender filaments, and shorter follicles with more strongly curved beaks.—*J. C. Nelson.*

4016. Suksdorf, W. N. **Washingtonische Pflanzen III.** Werdenda. Beiträge zur Pflanzenk. **1**: 1–14. 1923.—The following new species and varieties of plants of the State of Washington, U. S. A., are proposed: *Agrostis Schiedeana* Trin. var. *armata, Melica fugax* Bol. var. *inexpansa, Festuca Suksdorfii* Piper, *F. subbiflora, F. microstachya* Nutt. var. *subappressa, F. dives, Elymus acicularis, E. edentatus, Sitanion hordeoides, Carex nebraskensis* Dew. var. *erucaeformis, C. tenacissima, Juncus balticus* Willd. var. *condensatus, J. orthophyllus* Coville var. *congestus, Stenanthium rhombipetalum, Olysnium inflatum, Polygonum arenicola, Cerastium acutatum, Montia dipetala, M. humilis, Claytonia washingtoniana* (*Montia washingtoniana* Suks.), *C. spathulata* Dougl. var. *disciformis* (*M. spathulata* var. *disciformis* Suks., *C. latifolia* (*M. latifolia* Suks.), *C. interrupta* (*M. interrupta* Suks.), *C. parviflora* Dougl. var. *hydrophila* (*M. parviflora* var. *hydrophila* Suks.), *C. parviflora* Dougl. var. *adsurgens* (*M. parviflora* var. *adsurgens* Suks.), *C. parviflora* Dougl. var. *rupestris* (*M. parviflora* var. *rupestris* Suks.), *C. parviflora* Dougl. var. *latior, C. parviflora* Dougl. var. *sparsiflora, C. cupulata, C. rupicola, Lupinus bingenensis,* and *L. amphibius.*—*J. M. Greenman.*

4017. Thompson, H. S. **Vicia bithynica.** Jour. Bot. **60**: 209–210. 1922.—Because of its uncertain appearance as to quantity from year to year, the author concludes that *Vicia bithynica* L. is an annual or possibly a biennial, instead of a perennial as given in most of the standard floras.—*Adele Lewis Grant.*

REVISIONS AND MONOGRAPHS

4018. Koidzumi, G. **Synopsis specierum generis mori.** [**Synopsis of the species of the genus Morus.**] Bull. Imp. Sericultural Exp. Sta. Japan **2**: 1–45. *11 pl.* 1923.—The author gives a systematic enumeration of all species of *Morus* with citation of synonyms and literature, but only the species occurring wild or cultivated within the Japanese empire are fully described and figured. The 11 double size plates are the same as in the author's earlier paper on *Morus* written in Japanese and published in 1917 in an earlier issue of the same periodical. The following varieties and combinations are new: *Morus bombycis* Koidzumi vars. *aphananthoides, declinata, lancifolia, vestita, squarrosodentata, maritima*; *M. acidosa* Griff. var. *glabra*; *M. alba* L. var. *argutidens.*—*Alfred Rehder.*

4019. Lacaita, C. C. [Rev. of: Lanza, Domenico. **Monografia del genere Calendula L.** (**Monograph of the genus Calendula.**) Atti. R. Accad. Sci. Lettere e Belle Arti Palermo **9**: 166. *Pl. 10.* 1919.] Jour. Bot. **60**: 184–186. 1922.

4020. Mez, Carl. **Additamenta monographica 1922. Myrsinaceae papuanae.** [**Supplementary monograph on the Myrsinaceae of Papua (New Guinea).**] Bot. Archiv **1**: 125–128, 230, 255–256; **2**: 34, 173–176, 210–212, 259–260. 1922.—The following new species are described: *Maesa Bismarckiana, M. loranthifolia, M. serpentino-picta, Ardisia Ledermanni, A. Gjellerupii, A. lepidula, A. inconspicua, A. acutiloba, A. laciniata, A. bisumbellata, A. dasyneura, A. novaguineensis, A. aliena, A. Schultzei, A. apus, Conandrium Ledermanni, Ardisia rigidula, A. decurviflora, A. laxa, A. pustilata, A. lauracea, Conandrium majus, C. Peekelii, C. multipunctatum, C. finisterrae, Discocalyx perseifolia, Loheria sessilifolia, L. latepetiolata, Grenacheria Ledermanni, G. buxifolia, Rapanea Schlechteri, R. Agustae, R. rigidula, R. acrosticta, R. laccata, R. guilhelmina, R. rhynchophylla, R. membranifola.*—*William Seifriz.*

4021. Prodoehl, Alice. **Oryzeae monographice describuntur.** [**A monograph of the Oryzeae.**] Bot. Archiv **1**: 211–224, 231–255. 1922.—Species of the following 11 genera are described: *Hygroryza* (1 sp.), *Leersia* (14 spp.), *Oryza* (17 spp.), *Maltebrunia* (4 spp.), *Potamophila* (1 sp.), *Hydrochloa* (1 sp.), *Luziola* (8 spp.), *Caryochloa* (1 sp.), *Zizania* (6 spp.), *Pharus* (9 spp.), *Leptaspis* (4 spp.). The following species are new: *Oryza Mezii, O. Schweinfurthiana, O. grandiglumis, O. Abromeitiana, Luziola Doelliana, L. gracillima, Zizania Mezii, Pharus Mezii.*—*William Seifriz.*

4022. R[endle], A. B. [Rev. of: Percival, John. **The wheat plant: a monograph.** *x* + *463 p., 228 fig.* Duckworth: London, 1921.] Jour. Bot. **60**: 186–187. 1922.

FLORISTICS AND PLANT DISTRIBUTION

4023. Anderson, Kate P. **Flowering trees and shrubs of the Lower Rio Grande.** Amer. Forest. **29**: 351–358, 377. *28 fig.* 1923.

4024. B[aker], E. G. [Rev. of: Engler, A. **Die Vegetation der Erde. (The vegetation of the earth.) IX. Die Pflanzenwelt Africas. (The plant-world of Africa.)** Vol. 3. Part 1. *869 p., 401 fig.* 1915; Part 2. *878 p., 338 fig.* 1921. Engelmann: Leipzig.] Jour. Bot. **60:** 304–306. 1922.

4025. Barrett, L. A. **Quercus chrysolepis Liebm. in Boquet Cañon.** Madroño **1:** 99. 1923.—The largest specimen of this species known to the author is found in the Santa Barbara National Forest. It is over 10 feet in diameter, 85 feet in height, and has a spread of 125 feet. —*Roxana Stinchfield Ferris.*

4026. Bennett, Arthur. **Scheuchzeria palustris L. in Thorne Moors.** Naturalist **1921:** 128. 1921.—The author refers to a note by R. Butcher, Ibid. **1921:** 117. 1921, and Woodruffe Peacock, Ibid. **1921:** 22. 1921, and gives information of herbarium specimens dated 1847 and 1850.—*W. H. Burrell.*

4027. Carter, W. R. **Botany.** Rept. Prov. Mus. Nat. Hist. [Victoria, British Columbia] **1921:** 13–16. 1922.—A list of supplementary additions to the Flora of Vancouver and Queen Charlotte Islands, 1921, is included. Also a list of accessions to the herbarium of the Provincial Museum is given.—*W. C. Muenscher.*

4028. Carter, W. R. **Botany.** Rept. Prov. Mus. Nat. Hist. [Victoria, British Columbia] **1922:** 13–15. 1923.—A list is included of 24 additional species to the Flora of British Columbia and Queen Charlotte Islands, 1921. Several interesting extensions of the previously known ranges of species are noted.—*W. C. Muenscher.*

4029. Chisholm, E. C. **The flora of Marrangaroo, County of Cook.** Australian Nat. **5:** 122–129. 1923.—The author gives a list of plants by families and something of their distribution. The county is 100 miles from Sydney, Australia, has 40–50 inches of rainfall, and temperature 16–90°F.—*T. C. Frye.*

4030. Farwell, Oliver Atkins. **Botanical gleanings in Michigan.** Amer. Midland Nat. **8:** 263–280. 1923.—This is a record of the distribution of the more interesting plants in various parts of the State. Many of the plants listed were collected by Farwell and Gladewitz in 1823. The names of other collectors with the dates and places of their findings are also given. The following plants are described as new: *Allionia Gladewitzii, Nymphozanthus variegatus* (Engelm.) Fernald var. *lutescens, Euphorbia corollata* L. var. *viridiflora, E. dentata* Michx. var. *lancifolia, Castilleja coccinea* (L.) Spreng. f. *lutescens* and f. *alba.* The following new combinations are included: *Oenothera parviflora* L. var. *canescens* (*O. biennis* var. *canescens* T. & G.), *O. parviflora* L. var. *muricata* (*O. muricata* L.), *O. biennis* L. var. *rubricaulis* (*O. muricata* var. *rubricaulis* Farwell), *Erigeron canadense* L. var. *strictum* (*E. strictum* DC.), *Helianthus scaberrimus* Ell. var. *subrhomboideus* (*H. subrhomboideus* Rydb.).—*Sister M. Ellen.*

4031. Feudge, J. B. **Notes on some San Bernardino plants.** Bull. Southern California Acad. Sci. **21:** 41–42. 1922.—New stations are given for *Frasera Parryi* Torr., *Purshia glandulosa* Curran, *Prunus fasciculata* Gray, and *Yucca mohavensis* Sargent.—*Roxana Stinchfield Ferris.*

4032. Firth, Joe. **Andromeda polifolia near Halifax.** Naturalist **1920:** 220. 1920.—The writer never saw the plant so luxuriant and the flowers so abundant as recently on Soyland Moors, although it is said to be a decreasing species. [See also Butterfield, E. P. Ibid. 272.]—*W. H. Burrell.*

4033. Fry, Walter. **Yucca Whipplei in the Sierra foothills.** Madroño **1:** 131. 1923.—There were no Yuccas in the Sequoia National Park in 1860 though there are a large number now. Their spread northward has been accomplished probably by birds and their increase is due to fire protection.—*Roxana Stinchfield Ferris.*

4034. Haley, W. Balmforth. **Plants in the Scilly Isles.** Naturalist **1921:** 328. 1921.—*Diotis maritima* at St. Martins and *Spiranthes spiralis* at St. Agnes are noted. In a later note (Ibid. 375. 1921) Arthur Bennett mentions that *Diotis* was last gathered on Pra Sands in 1881; before that it was not known to have occurred for a century.—*W. H. Burrell.*

4035. Jepson, W. L. **A conifer new to California.** Madroño **1:** 116. 1923.—A form of *Picea Engelmannii* Parry has been discovered in Shasta County.—*Roxana Stinchfield Ferris.*

4036. Jepson, W. L. **Physalis ixocarpa Brot.** Madroño 1: 116. 1923.—This species has been introduced into California from the south and has spread northward as far as southern San Benito County.—*Roxana Stinchfield Ferris.*

4037. Козо-Полянски, Б. М. [Kozo-Poljanski, B. M.] **Заметка о затерянном роде Platylophium Turcz.** [Note on the forgotten genus Platylophium Turcz.] **Известия Главного Ботанического Сада** [Bull. Bot. Gard. Petrograd] **1921:** [1–2]. 1921.—The author recalls this genus of Umbelliferae, which has apparently been forgotten. It is not noted in Boissier's Flora, Index Kewensis, Post-Kuntze Lexicon, etc. This genus is probably related to *Ferula* and is indigenous to the Taurus Mountains.—*V. Lashevski.*

4038. Krylow, P., and E. Steinberg. **Materials for a flora of the Kansk region.** Trav. Mus. Bot. Acad. Sci. Russ. **17:** 1–156. *1 pl., 1 map.* 1918.—The region concerned in this paper centers about Kansk, a station on the Trans-Siberian Railway, Siberia. About 1,000 species and varieties of vascular plants are recorded, including *Oxytropis Kusnetzovi* n. sp.—*J. M. Greenman.*

4039. Linebaugh, Rose. **Cercis occidentalis Torr. (Red bud.)** Madroño 1: 99. 1923. —The distribution of *Cercis* in the inner Coast Ranges is discussed, and its possibilities in gardens is remarked upon.—*Roxana Stinchfield Ferris.*

4040. Parish, S. B. **Additions to the introduced flora of California.** Madroño 1: 115. 1923.—*Richardia africana* Spreng., *Althea rosea* Cav., *Salvia Verbenaca* L. are becoming established in the bay region and *Cytisus monspessulanus* L. is established locally on the coast of Monterey County.—*Roxana Stinchfield Ferris.*

4041. Pieters, A. J. **Some immigrant clovers.** Science **59:** 39–40. 1924.—*Trifolium striatum* L., an European species, has been found in northern Georgia. At Snow Hill, Alabama, the following species of *Trifolium* were collected: *T. glomeratum, T. lappaceum, T. nigrescens, T. resupinatum, T. scabrum, T. suffocatum,* and *T. tomentosum.*—*C. J. Lyon.*

4042. Riddelsdell, H. J. **Ranunculus Lingua in E. Gloucester.** Jour. Bot. **60:** 239. 1922.—The 1st authentic record of the occurrence of this species in E. Gloucester is made.—*Adele Lewis Grant.*

4043. Römer, J. **Ein neuer Bürger der Siebenbürgischen Flora. Linnaea borealis.** [A new citizen of the flora of Transsylvania.] Bul. Inform. Grădinii Bot. Muz. Bot. Univ. Cluj **2:** 115–116. 1922.—This circumpolar plant was discovered in the Călimanului Mountains of the eastern Carpathians.—*Al. Borza.*

4044. Salmon, C. E. **Juncus compressus in S. E. Yorkshire.** Jour. Bot. **60:** 122. 1922. —The occurrence of this species at the edge of Hornsea Mere in Vice-County 61, is noted.—*Adele Lewis Grant.*

4045. Smirnov, N. **La végétacion des rives escarpées du fleuve Oredesch.** [The vegetation of the steep banks of the Oredesch River.] Jour. Bot. Soc. Russ. **2:** 139–141. 1918.—*Rosa cinnamomea* L. var. *petropolitana* n. var. is included among other characteristic plants listed for this region.—*J. M. Greenman.*

4046. Smirnov, N. **Quelques nouveautés de la flore adventive de Petrograd.** [Some novelties adventive to the flora of Petrograd.] Jour. Soc. Bot. Russ. **2:** 138–139. 1918.—*Vaccaria vulgaris* Host., *Beckmannia eruciformis* Host., *Coronopus didymus* Sm., and *Carduus nutans* L. are reported from Petrograd.—*J. M. Greenman.*

4047. Wilmott, A. J. **Two Alchemillas new to Britain.** Jour. Bot. **60:** 163–165. 1922.—*Alchemilla glomerulans* Buser and *A. vulgaris* L. emend. Buser are recorded from Scotland. —*Adele Lewis Grant.*

4048. Yeomans, F. C. **Umbellularia californica in Lake County.** Madroño 1: 132. 1923. —The California laurel has the habit of stump sprouting. One tree was noted having a diameter of 5.72 feet.—*Roxana Stinchfield Ferris.*

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

S. F. Trelease, *Editor*

4049. Anonymous. **Further experiments with contaminated milling wheat.** Agric. Gaz. New South Wales **34:** 852. 1923.—When wheat contaminatied with sweet clover odor is

treated with 1% freshly burned ground lime, and allowed to stand for 1 week, no ill effects are noticed in the bread. [See also Bot. Absts. 13, Entry 2127.]—*L. R. Waldron.*

4050. Anonymous. **Report of the committee on standard methods.** Amer. Jour. Public Health 14: 41–42. 1924.—This is a report of a meeting of the Committee on Standard Methods, Laboratory Section, American Public Health Association, held in Boston, Oct. 8, 1923, to consider proposed changes in standard methods of water analysis and milk analysis. A list is given of proposed changes, which were discussed but not acted upon.—*C. A. Ludwig.*

4051. Allen, E. W. **The administration of agricultural research.** Science 58: 499–502. 1923.

4052. Bolley, H. L., and O. A. Stevens. **North Dakota pure seed law. Interpretations and suggestions.** North Dakota Agric. Exp. Sta. Circ. 20. *8 p.* 1923.

4053. Bolley, H. L., and O. A. Stevens. **Seed certification and listing.** North Dakota Agric. Exp. Sta. Circ. 21. *4 p., 2 fig.* 1923.

4054. Conn, H. J. **Progress in the certification of biological stains.** Science 59: 18. 1924.—Haematoxylin has now been put on the same basis of certification as methylene blue. Both dyes may be ordered from any regular dealer. A copy is printed of the text of a label on certified material—*C. J. Lyon.*

4055. Данилов, А. Н. [Danilov, A. N.] **Симбиоз, как фактор зволюции. [Symbiosis as a factor of evolution.]** Bull. Jard. Bot. Princip. Rep. Russe 20^2: 122–137. 1921 [1922].—The author cites some common cases of plant symbiosis (lichens, chimaeras, Erickson's mycoplasm, etc.) and concludes that a natural synthesis of heterogeneous organisms has a marked influence in the formative processes.—*B. Kozot-Poljanski.*

4056. Denham, Humphrey J. **Reduction of microscope fatigue.** Bot. Gaz. 76: 311–315. *Fig. 1–3.* 1923.—If fatigue arises from faulty illumination, a correction is suggested which involves the use of a variable artificial light supplemented by a suitable light filter. The "Pointolite" bulb is recommended.—*B. W. Wells.*

4057. Horton, W. **Microscopical technique.** Ann. Bot. 37: 728–730. 1923.—This is the 1st of a series of short notes on overcoming difficulties in paraffin technique. It deals with the stretching of ribbons on slides and advocates the use of a vessel with a concave bottom which is inverted in and projects slightly from a dish of water. The slides rest on the edge of the vessel over the concavity and the water is held at a temperature just below the melting point of the paraffin.—*W. P. Thompson.*

4058. McClung, C. E. **Haematoxylin.** Science 58: 515. 1923.—White crystals are made by treatment with SO_2, and the stain is made less stable than when light brown crystals are used. If, in the iron-haematoxylin method, the stain is not satisfactory, the addition of lead acetate will correct it.—*C. J. Lyon.*

4059. Needham, J. G. **Entomological uses for Yucca stems.** Entomol. News 35: 19–21. 1924.—The writer describes several purposes which dried Yucca stems serve, such as for pinning blocks and mailing cases for small vials.—*O. A. Stevens.*

4060. Southgate, H. W. **A suggested substitute for Canada balsam as a mounting medium.** Jour. Roy. Microsc. Soc. London 1923: 311–314. 1923.—Hard Yucatan elemi (200 gm.) is dissolved cold in 200 cc. of ethyl alcohol (commercial), and filtered. The filtrate is evaporated until dry, and dissolved in pure xylol. Advantages of this as a mounting medium are: freedom from organic acids; complete solubility in alcohol, xylol, benzene, etc.; a good refractive index; good drying and setting properties; apparent permanence of stains in this medium; and relative cheapness.—*Ralph E. Cleland.*

4061. Stevens, O. A. **How to use the seed laboratory.** North Dakota Agric. Exp. Sta. Circ. 22. *12 p., 5 fig.* 1923.

4062. Van Heurn, F. C., en K. Heusser. **Vlekken op sheets. [Spots on sheet rubber.]** Mededeel. Alg. Proefsta. A.V.R.O.S. Rubberser. 25. *3 p.* 1920. [Reprinted from: Arch. Rubbercult. 4: No. 5. 1920.]—In the preparation of rubber sheets, the presence of a violet color in the coagulum may result later in the appearance of bluish spots on the sheets. These spots may be occasioned by oxidizing enzymes, or they may appear in the latex because of the physiological condition of the tree at tapping. The rubber itself is not oxidized, but action goes on in the foreign particles present in the latex. These particles can be filtered out, and then give the blue color reaction. Addition of small quantities of bisulphides is in many cases sufficient to prevent appearance of blue spots on sheets.—*Cecil Yampolsky.*